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OPERATION OF SEWAGE DISPOSAL PLANTS

Purchasing, Mixing and Applying Hypochlorite—Typical Mistakes in Applying—Apparatus for Retaining and Controlling Flow—Liquid Chlorine, Advantages and Disadvantages Compared with Hypochlorite.

By FRANCIS E. DANIELS, A. M.*

This is the eighth installment of a series of articles by Mr. Daniels. The others were as follows: January 15—Grit chambers and screens; regular frequent cleaning most important. February 19—Skimming, sedimentation at septic tanks; keeping daily records of operation; duplicate units; treatment of sludge and scum. March 10—Emscher tanks; principles of operation and design; baffles and scum boards; gas vents and scum; cleaning slopes and slots; drawing off sludge; sludge beds and sludge disposal. April 16—Contact and sprinkling filters—periods for each of the four phases; filtering medium and drainage; keeping surface open; automatic control apparatus; how to make putrescibility tests. May 21—Sprinkling filters, care of nozzles, settling basins; natural and artificial sand filters. June 18—Operation of sand filters; land treatment; sub-surface irrigation. July 16—Disinfection; purpose, principle, history. Condition of sewage necessary. Application of hypochlorite.

DISINFECTION. APPLYING HYPOCHLORITE

Having determined upon the size of the dose, the next thing is to apply it to the sewage or effluent at a uniform rate. The best practice is to dissolve the required number of pounds in a given amount of water and feed the solution at a definite rate proportional to the flow of liquid to be disinfected. This is not so simple as one might at first suspect. Several things have to be looked out for. The commercial dry powder varies in strength and loses strength considerably when exposed to the air. There must be sufficient water to dissolve out the hypochlorite, and care must be used in mixing the solution. The solution is corrosive and acts on tanks, piping, valves, etc., and it also forms incrustations which cause frequent stoppages in pipes, valves and feeding devices.

Unless it is feasible to analyze each lot of bleach, it should be bought with the available chlorine specified by the dealer. As the material deteriorates upon opening, the contents of a whole container should be mixed at once if possible. In many plants, however, this cannot be done; in such cases the unused material must be kept tightly covered in a cool dry place. While the larger sized containers hold about 700 pounds, at a slight increase in price hypochlorite can be obtained in 350-pound or 100-pound drums, and in many cases the smaller sizes are to be preferred, both because of convenience in handling and to avoid the keeping of large quantities exposed to the atmosphere.

In the mixing of the bleach, the active hypochlorite is dissolved while the inert lime and other insoluble impurities remain. Usually the bleach is thoroughly mixed with a small amount of water into a paste or cream so as to break up the lumps, then more water is added and the whole transferred to the solution tank, and agitated until a thoroughly homogeneous solution is obtained.

As it is very important that the solution be of the same strength throughout, and as this mixing is a laborious process, a power mixer should always be installed except, perhaps, for very small quantities. After all the hypochlorite has been dissolved and the solution once properly stirred up, the strength remains the same throughout the tank.

In some plants the contents of a whole container of bleach are washed out into the solution tank by means of a stream of water from a hose, and the whole agitated until a thorough solution is obtained. In the mixing, care must be used to get the material thoroughly broken up and agitated so that all the hypochlorite will be dissolved or else a considerable amount of material will be wasted. The writer has known of over fifty per cent waste, due to improper methods of mixing. He has suggested a mixer in the form of a mill or grinder, so that the bleach could be fed through and ground with a stream of water. This he believes would break up lumps and hasten the process.

One should not attempt to dissolve too much hypochlorite in a given amount of water. The solubility of bleach is only about five per cent, and a five per cent solution is difficult to obtain and difficult to handle. It is much better, when possible, to use a weaker solution, say two or three per cent.

It is usually better to keep the solution the same strength by mixing the required number of pounds according to the strength of the dry powder, and to vary the dose by changing the feeding device. A rod should be laid off, showing the number of pounds to be used for different depths of water in the tank, from the top down, so that if all of the solution is not run out the rod will show immediately the number of pounds to be used for the amount of water necessary to fill up the tank.

Whatever may be the claim of the manufacturers of the bleach, the attendant should know the value of the solution he is using. This he can easily determine in a few minutes by simple chemical tests with inexpensive apparatus. The standard solutions for the test can be obtained from chemical supply houses or made up by a chemist, and the methods of using them are described in standard books on volumetric chemical analysis.

The State of Board of Health is always ready to instruct attendants how to make the determinations referred to.

The writer has met with many unscientific methods of managing solutions of chloride of lime and faulty ways of applying the disinfectant to the sewage flow. The principles and limitations of sewage disinfection are so

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little understood and the plants are so frequently out of order that the writer has almost come to regard a hypochlorite plant for the treatment of sewage as a necessary evil. At one installation a quantity of chloride of lime was mixed and the clear supernatant liquor fed out the first day. On succeeding days water alone was added to the settled sludge which was only inert lime and impurities. The solution was allowed to settle and the clear liquor again fed to the sewage. This was repeated for about four weeks without the slightest suspicion but that everything was done properly although all of the *hypochlorite* ran out the first day, leaving nothing but a little lime water for the rest of the month. At another plant a solution was made up and about one-third of the tankful used the first day. Instead of using the remainder in two portions the next two days, the tank was filled with water, thus diluting the solution. This trick was repeated for a few weeks until the writer explained to the man in charge the fallacy of such a procedure. These two instances are cited not so much for criticism as to show how easy it is to go wrong in these matters if the principles are not well understood. The first plant was run by the chief engineer of one of our large state institutions, and the second was under the direct supervision of a prominent city official. At another plant the disinfecting solution was found running into a "dead" compartment of the storage tank so that practically none whatever was getting into the flowing sewage.

Mention has already been made of the practice developed by one plant attendant, of applying the chemical by dumping a shovelful of it once a day into a manhole in the outfall sewer. A similar scheme for the disinfection of the sewage of an entire town has been proposed; namely, to haul around the bleach solution in a cart or tank wagon, and apply a little periodically to one or more of the manholes in the sewer system. The reasons why these schemes are bad have been explained above.

Although sewage disinfecting plants have been in operation in New Jersey for several years, it has been only in very recent time that an inspector from the State Board of Health could make a chance visit and find a plant working as it should. Invariably something would be found wrong and the excuse would be that it "just happened." A valve would be corroded, the flow cut off by stoppages, supply of bleach exhausted, ejector or pump out of order, or one or more of a dozen other things which put the plant out of commission. In addition to skilled supervision, disinfection plants need almost constant attention day and night. Recently, however, the owners of some of our disinfection plants have taken hold of the process in earnest, and keep an attendant almost constantly on the premises. Such plants are giving good results.

Tanks for hypochlorite solutions should be made of concrete or iron. Wooden tanks, if lined with cement mortar, are fairly satisfactory. There are on the market paints and coating materials for wooden tanks, which are said to withstand the action of bleach, but the writer has not used them personally.

Whenever the slightest leak develops in a wooden tank it should be stopped immediately, as the flow of bleach through the leak cuts away the wood very rapidly. Some of our tanks are made out of sections of terra cotta sewer pipe, with a cement bottom. As stated above, solution tanks should be of ample size, and if possible equipped with power agitators, as the proper mixing by hand of a large batch of hypochlorite is a laborious process, and the entire contents of the tank should be thoroughly agitated to insure a homogeneous solution. To facilitate dosing

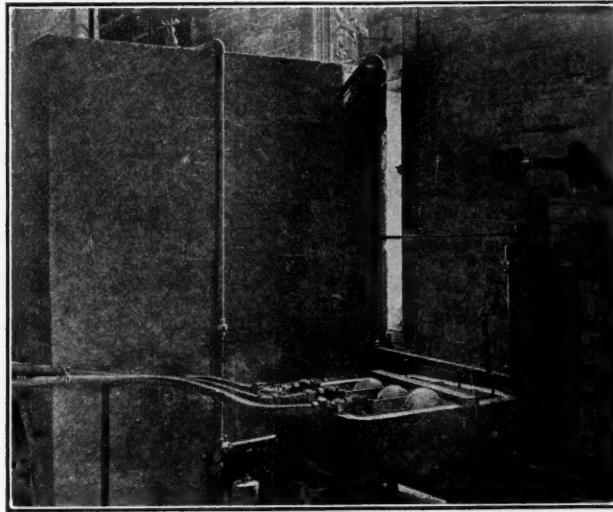
through small orifices, the lime sludge is allowed to settle out and only the clear supernatant liquid used. The clear liquor is either drawn off into another tank, from which it is fed out while another batch is being prepared, or the two tanks are placed side by side and used alternately. The unused lime sludge is drawn off as often as necessary and run into the sewage tank to be disposed of along with the sewage sludge.

To control the flow of the clear liquor several forms of apparatus have been used. Some are good and some are bad. Valves and spigots attached to tanks so that the head of solution on the valve decreases as the tank empties, are unreliable. A constant head feed box should always be provided. The level in this box can easily be maintained by means of a bronze float valve, after the pattern of those used in water-closet flush tanks. When such a valve was not available the writer has used a rubber tube, one end of which was slipped over the down-turned end of the inlet pipe, and at the other end a float attached. The float upon rising kinked the tube and cut off the inflow. When the liquid ran out and the float dropped, the tube allowed an inflow which was discharged into the box through a hole cut in the side of the tube. Another good arrangement is to feed the solution into the orifice box from an air-tight tank, arranged so that an air pipe leading from the top of the tank just touches the liquid in the orifice box. When the liquid lowers and frees the end of this pipe, air is admitted and enough solution is emptied into the box to cut off the air and stop the flow. This principle is illustrated by the well-known drinking fountains for chickens, and in emergencies can be quickly rigged up with tight barrels. The discharging device may be a conical plug valve with a scale and pointer for regulating or, better yet, an orifice. Valves are objectionable because the flow through them cannot be seen; hence slight stoppages are not readily detected. They have to be cleaned frequently, and at such times the flow has to be stopped and the valve taken apart. Globe valves are especially bad and are difficult to regulate on small flows.

The better types of orifice boxes are made of iron, and lined with porcelain enamel. They are equipped with float valves made of special bronze, and so operated by a glass or hard rubber float that the solution is maintained at a constant depth. In some the orifice is situated in the bottom and is capable of being readily adjusted and set by means of a calibrated dial or drum. In another style the orifice is near the free end of a pivoted hard rubber tube which is raised and lowered automatically, by means of a float or pressure tubes from a Venturi Meter, to vary the depth of solution above the opening so as to compensate for variations in flow of the sewage. The size of the orifice may be adjusted by moving a lock-nut which travels on a thread over the slit in the pipe, which forms the orifice. In this type the slit should be of such a width that the opening is somewhat square and not long and narrow. This lessens the danger of stoppages from scales of carbonate, etc. Scales and incrustations by calcium carbonate form rapidly when bleach solution is exposed to the air, especially if the solution be strong; thus all surfaces wet with the liquid and exposed to the air quickly become incrusted. Pipes flowing partly full sooner or later become filled up with the coating. An automatic dipping cup at one of our water plants accumulated an incrustation of over an inch thick in a short time. A little muriatic acid dropped on the orifice now and then quickly dissolves off the coatings which form and diminish the size of the openings, and a little kerosene or paraffine

oil on the solution in the orifice box helps to prevent the formation of the troublesome scales of calcium carbonate. These scales get into the orifice and cut off the flow, especially if the orifice is small. This is not so frequent when dilute solutions and large orifices are used, but small orifices with strong solutions are exceedingly difficult to keep in order. Dilute muriatic acid may be used to flush out feed pipes now and then to reduce the incrustations.

One thing the makers of orifice boxes have not yet done—they have not provided for easy cleaning out. There should be a slope or sump in the bottom and an opening so that all sediment could be emptied and washed out in an instant. As these tanks have to be washed out every few days, under the present arrangement much time is unnecessarily consumed during which the flow of the solution must be stopped.



ONE TYPE OF HYPOCHLORITE FEED BOX.
Orifice is raised or lowered automatically by wires regulated
by pressure tubes from Venturi meter.

As is generally known, the flow through the orifice depends upon its size and the depth of liquid over it. Therefore, the attendant must know how to regulate the flow to deliver the required amount of solution in a given time. This is best done by referring to a table or chart calculated beforehand for the particular apparatus. A check upon the discharge apparatus should always be kept by calculating the capacity of the tank and noting the rate of drop of the liquid in the tank by means of a pointer on a scale. For this purpose the writer has used a scale laid off in hours and minutes, and whenever the tank was started the scale was set by the clock. Thus variations in flow could be detected at a glance.

As the hypochlorite fumes and solutions are very corrosive, all exposed metals should be kept painted, and moving parts should be watched and renewed as often as necessary.

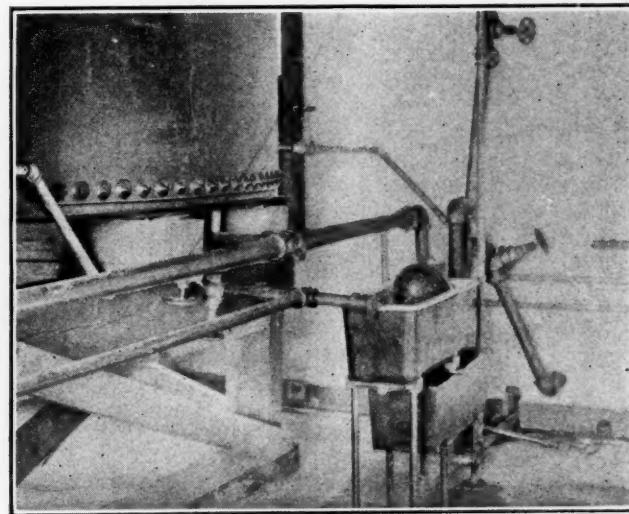
The piping conducting solutions should be of ample size, and should always be run in easily accessible places. Unless made of hard rubber or other non-corrosive material they are liable to give out with little warning. Stoppages are also liable to occur and for that reason the pipes should be frequently washed out. Lead is more durable than either iron or brass, but as all pipes carrying small flows are subject to incrustation, and consequent stoppage, it may be as well to use a cheaper material and renew it when necessary. The conducting of the solutions through long lines of piping should be avoided whenever possible, and if renewals cannot be made in a very short time the pipe lines should be run

in duplicate so as to keep one line always in reserve. Duplicates of all parts liable to have to be replaced, such as valves, pipes, nipples, fittings, etc., should be kept on hand nearby.

While it would not be objectionable to use lead piping in sewage plants, the writer has always hesitated to advise the use of lead pipes at water plants to conduct hypochlorite solutions into potable water. There may be no danger of lead poisoning from this source, but it is always well to be cautious where lead is concerned.

Whenever possible, the hypochlorite solutions should be diluted with a flow of water or clarified sewage immediately upon leaving the orifice box. This will lessen the corrosion of pipes, enable the pipes to flow full, thereby lessening incrustations, and aid in distribution.

No pumps, compressors, engines, motors, switchboards, or any machinery having exposed metal parts or



ONE OF THE TYPES OF ORIFICE BOXES IN USE FOR FEEDING CHLORIDE OF LIME SOLUTION.

belts should be located in the same room or near where hypochlorite is mixed, handled or stored in open containers.

LIQUID CHLORINE.

At one of our sewage disinfection plants liquid chlorine apparatus has just been installed as a substitute for bleach, for the disinfection of a tank effluent, and if the change proves advantageous another plant in the same town will be changed. At another installation the apparatus is ready to go in but on account of some delay it has not been set. A fourth installation for sewage has already been decided upon. In addition to these, two plants have been installed upon one of our large watersheds, each of which treats the entire flow of a small stream into which more or less pollution enters. From all accounts these have been quite successful.

Measured in terms of available chlorine, the relative efficiency of liquid chlorine and bleach seems to be about equal when comparatively large doses are used, as for sewage work; but with very small doses the liquid chlorine seems to be more efficient. More experimental data on these points are needed.

The principal advantages of liquid chlorine over bleach are less cost of operation and less space required for both apparatus and storage of material. There is no loss of strength, no mixing tanks are required, no lime sludge to bother with, and no empty drums to get rid of. Some of the types of control apparatus are comparatively expensive and all these things, together with the cost of chlorine at about 10 cents per pound as compared to bleach at twenty-five dollars per ton, should be consid-

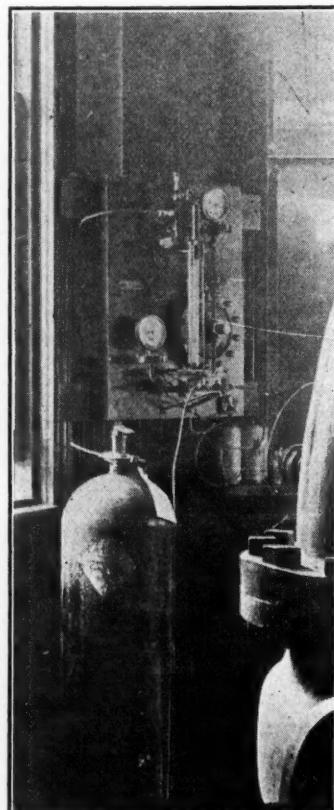
ered in making a choice for a sewage plant. For water disinfection the writer prefers liquid chlorine in most cases.

Liquid chlorine comes in steel tubes, or cylinders, holding about one hundred pounds, and under a pressure of something less than one hundred pounds per square inch. As soon as the pressure is released the chlorine immediately volatilizes, and issues in the form of a greenish, pungent, and highly corrosive gas. The gas is not explosive but is very suffocating and attacks most everything, especially if there is present the slightest trace of moisture. Great care should be taken to prevent even the slightest leak in the storage or handling of the material. Not long ago one of the cylinders of chlorine developed a leak in the storage room of a water plant, which caused considerable trouble for a while. Although every precaution should be taken to avoid the possibility of a leak, it is well not to have other apparatus or machinery in the same room, on account of some unavoidable accident.

The main problem in the application of chlorine has been in developing an apparatus which will accurately control the dose and at the same time withstand the corrosive effects of the gas. Several types of successful apparatus are now on the market, some of which dissolve the gas in water and feed the solution, while others feed the gas directly to the solution to be disinfected, distributing by means of porous earthenware, carbonized or other non-corrosive material. It might be mentioned that solutions of chlorine should be kept in the dark, as strong sunlight causes a reaction. The same applies to hypochlorite, and strong sunlight should never be allowed to shine on solutions of bleach.

The duties of the plant attendant in regard to chlorine apparatus are not very exacting. He must know how to set and regulate the apparatus; see that all parts are kept in good working order, and be on the lookout for leaks. Valves should be tested now and then, and not allowed to become corroded and stuck, and exposed metal parts kept painted. The presence of a leak can be located by holding a little strong ammonia near, as the ammonia and chlorine form dense white clouds. Except for the substituting of full cylinders for empty ones, the attendant has little to do. With those types of apparatus which regulate by means of the pressure of the gas, a check on the regulation should be kept by keeping the cylinder on scales, and making a record of the periodic loss in weight.

It might be of interest to mention an incident which is somewhat akin to the subject of disinfection. The writer noticed at one of the sewage disposal plants, the effluent of which goes into a potable water supply, that



LIQUID CHLORINE DISINFECTION APPARATUS.

at the outlet of the underdrains sewage red worms had begun to appear. Quick lime and even chloride-of-lime was tried, but, according to the attendant, with little success. He then procured a barrel of crude carbolic acid, and sprinkled a dilute solution of this over the filtering areas, with a watering pot. The worms were turned black and effectively destroyed by the process.

At other plants organic growths in underdrains are cleaned out and prevented by the application of a handful of copper sulphate now and then. At still others troublesome growths of the blue-green algae are kept down by means of copper sulphate.

STERILIZATION OF SEWAGE.

Washington, D. C., August 7, 1914.

Editor Municipal Journal,

50 Union Square, New York City.

Dear Sir: In your issue of July 16 you have outlined the general conclusions regarding the possibility of the utilization of calcium hyperchloride in the sterilization of sewage.

It is probable that you have overlooked Bulletin No. 115 of the Bureau of Plant Industry, Department of Agriculture, entitled "The Disinfection of Sewage Effluents for the Protection of Public Water Supplies," a copy of which is inclosed. The experiments recorded in this pamphlet were conducted under natural conditions and on the entire flow of the different sewage-disposal stations. In other words they are practical tests of this matter of sterilization. On page 30, the paragraph immediately preceding the tabular statements, reports the conclusions from tests that I believe are similar to the tests you had in mind as desirable at the time of the preparation of your editorial.

Yours very truly,

KARL F. KELLERMAN,
Physiologist in Charge, Bureau of Plant Industry,
Dept. of Agriculture.

In writing the editorial referred to by Mr. Kellerman, the point we wished to make in connection with sterilization was that certain experiments on so-called crude sewage had apparently misled a number of engineers into believing that the crude sewage as found in the average sewer could be successfully sterilized by the method described, which we believe to be impractical. The experiments which formed the basis of Bulletin 115, referred to by him, were made about seven years ago, and interest in them has probably been superseded by that in the later experiments; which is in some respects unfortunate, since many of the conclusions from these earlier experiments are fully as reliable as those from the later, one of which was that the disinfection of even septic effluent (to say nothing of crude sewage) was found to be very irregular, owing to the presence of particles of suspended matter. On this point the report might well be quoted: "Available evidence seems to point to the strong advisability of thoroughly settling a septic tank effluent in the case of contemplated chlorine treatment, except, of course, in those special cases where the flexibility of the design of the septic tanks is such that a well-settled septic effluent is normally obtained at all times."

Mr. Kellerman's letter might be understood as implying that these tests were made upon crude sewage as received from the sewer, although he does not state this. As a matter of fact, all of the experiments detailed in the bulletin were made upon effluents, most of them from filters, although some of the effluents treated were from settling or septic tanks. In no case, we believe, were efforts made to apply disinfecting methods to crude sewage.

The important point, which cannot be too strongly emphasized, is that it is practically impossible to effect any high degree of sterilization in a sewage which carries

particles of suspended matter sufficiently large to shelter contained bacteria from actual contact with the disinfecting substance.

MATERIALS USED FOR LONDON SEWERS.

Small sewers in London, England, are made of glazed stoneware or fire-clay pipes surrounded with 6 inches of cement concrete. Larger sewers are of brick or concrete. One brick sewer built 60 years ago of good brick and lime mortar has had its invert worn to a depth of 4½ inches; velocity of sewage from 3 to 7 feet per second. Others in use 50 years, with cement mortar joints, have their invert rough only; velocity of sewage 3 to 6 feet per second. Concrete sewers are not very satisfactory, as the matrix wears away somewhat rapidly, leaving the stones projecting. But recent special work lined with a concrete of 1 part small granite chips, 2 parts sand and 1 part Portland cement are expected to be more satisfactory.

As far as possible the use of metal in sewers is avoided. Wrought iron corrodes badly unless kept well painted. Recently such work has been galvanized. Where possible cast iron is used, with gun metal or phosphor-bronze screws, bushes and faces. Working parts require regular cleaning and greasing.

SEWERAGE TREATMENT PLANTS

Additional Plants Not Included in Previous List, Bringing Total Up to Nine Hundred—Complete Lists for California and Pennsylvania.

In our issue of June 18 we published a list of more than 600 plants, both municipal and institutional and private, for treating sewage; stating in connection therewith that additions to the list were expected and would be published in a future issue. We also requested any who knew of plants not contained in this list to inform us concerning these. Since then we have received a very complete list from Professor Hyde, of the State Board of Health of California, giving the sewage disposal plants in that state, others giving plants in North Carolina and Florida from the respective state boards, and statements from the state boards of Nevada, New Hampshire, New Mexico and Vermont, each saying it knows of no municipal sewage purification plant in that state; also one from the secretary of the State Department of Health of Iowa saying that the sanitary engineer and the engineering department of the Iowa State College are collecting data, but will not have them completed before the close of the year; consequently, no official information is furnished by this department. In addition to these, we have received from Kenneth Allen, engineer of the (New York) Metropolitan Sewerage Commission, a list of almost 100 plants, and from the Pennsylvania health department one of all plants in that state, private and institutional. This adds to our previous list a total of 200 municipal plants, making the total number of municipal plants so far listed by us 629; and of institutional and private, 271.

Concerning the California plants, Professor Hyde gives additional information concerning the plants listed, as follows: Of the 231 municipalities of the state, public sewerage systems are found in 157 having a total population of 1,577,100; private plants are found in 10 municipalities with a total population of 10,200, and 64 are without sewerage systems. In addition, there are three sanitary districts having public sewerage systems. Of the 170 sewerage systems, 27 dispose of untreated sewage

(Continued on page 231.)

MUNICIPAL SEWAGE TREATMENT PLANTS IN THE UNITED STATES.

Cities operating sewage treatment plants.	General description of plant.	Population by 1910 census.
Arizona:		
Tucson	Broad irrigation	...
California:		
Anaheim	Imhoff tanks, public and private sewer farms	2,628
Auburn	Septic tanks	2,376
Bakersfield*	Septic tank	1,190
Bishop	Septic tanks and sewer farm	544
Boulder Creek	Septic tanks	3,750
Chico	Imhoff tank under construction; public sewer farm	1,000
Clovis	Septic tanks	4,199
Coalinga	Septic tanks	621
Colfax	Septic tanks	2,500
College Park Sanitary District B	Septic tanks, chemical disinfection	1,582
Colusa	Septic tanks	703
Concord	Septic tanks	972
Corning	Septic tanks and sewer farm	3,540
Corona	Septic tanks, public sewer farm	827
Diuba	Septic tanks, sub-surface irrigation	500
Dixon	Septic tanks and contact beds	1,661
East San Diego	Septic tanks	1,610
East San Jose	Septic tanks	1,257
El Centro	Septic tanks, public sewer farm	2,437
Eldridge*	Tank	488
Elsinore	Septic tanks and sewer farm	1,334
Escondido	Septic tanks	883
Fortuna	Septic tanks	1,725
Fullerton	Imhoff tanks and public sewer farm	2,011
Gilroy	Septic tanks	679
Hanford	Septic tanks, public and private sewer farms	1,257
Healdsburg	Septic tanks	870
Hemet	Septic tanks and sewer farm	1,814
Hermosa Beach	Septic tanks	2,030
Imperial	Septic tanks and public sewer farm	17,809
Lakeport	Septic tanks	745
Larkspur	Septic tanks (part only)	2,232
Lemoore	Septic tanks and public sewer farm	2,697
Lincoln	Septic tanks	2,404
Lindsay	Septic tanks, public sewer farm	3,102
Livermore	Septic tanks	2,551
Lodi	Septic tanks, contact beds and sand filters	4,034
Long Beach	Septic tanks	3,576
Los Banos	Septic tanks	1,161
Los Gatos	Septic tanks	5,791
Madera	Septic tanks and public sewer farm	445
Merced	Septic tanks	892
Mill Valley	Imhoff tanks	2,404
Modesto	Septic tanks	2,696
Monrovia	Septic tanks	1,254
Monterey*	Septic tank	3,576
Mountain View	Septic tanks	884
Napa	Septic tanks	15,212
Newport Beach	Septic tanks	2,608
Newman	Septic tanks	1,603
Orange	Septic tanks and private sewer farm	5,157
Orland	Septic tanks and public sewer farm	836
Oroville	Septic tanks	3,859
Oxnard	Septic tanks	2,555
Pleasanton	Septic tanks and sand filters	2,696
Porterville	Septic tanks and sewer farm	2,935
Redondo Beach	Septic tanks	884
Rio Vista	Septic tanks	1,603
Riverside	Septic tanks	2,608
Roseville	Septic tanks	5,157
St. Helena	Septic tanks	1,254
San Jose*	Septic tank and contact beds	2,935
San Louis Obispo	Septic tanks	1,603

Cities operating sewage treatment plants.	General description of plant.	Population by 1910 census.	Cities operating sewage treatment plants.	General description of plant.	Population by 1910 census.			
California—(Continued)								
Santa Ana	Septic tanks	8,429	Guthrie Centre*	Septic tanks and sand filters	.....		
Santa Cruz	Septic tanks	11,146	Marion*	Septic tank and sand filters.	.....		
Santa Maria	Imhoff tanks and public sewer farm	2,260	Mason City*	Imhoff tanks and sprinkling filters; two plants.	.....		
Santa Monica	Electric treatment	7,847	Mt. Vernon*	Tank and sand filters.	.....		
Santa Paula	Septic tanks	2,216	New Hampton*	Septic tank and sand filters.	.....		
Saratoga Sanitary District No. 1	Septic tanks and private sewer farm	400	Oelwein*	Septic tank and sand filters.	.....		
Sebastopol	Septic tanks	1,233	Osceola*	Septic tank	.....		
Selma	Septic tanks and public sewer farm	1,750	Pella*	Tank	.....		
Sisson	Septic tanks	636	Perry*	Septic tank	.....		
Sonoma	Septic tanks	957	Reinbeck*	Septic tanks and sand filters	.....		
Susanville	Septic tanks	668	Sheldon*	Septic tank and sand filters.	.....		
Taft	Septic tanks	2,000	Storm Lake*	Septic tank and sand filters.	.....		
Tracy	Septic tanks and private sewer farm	1,200	Tipton*	Septic tanks and sand filters	.....		
Tulare	Septic tanks and public sewer farm	2,758	Traer*	Tank	.....		
Turlock	Septic tanks and public sewer farm	1,573	Valley Junction*	Tank	.....		
Ukiah	Septic tanks	2,136	Waukon*	Tank	.....		
Vacaville	Septic tanks and public sewer farm	1,177	West Liberty*	Tank and sand filters	.....		
Venice	Septic tanks	3,119	Kansas:					
Willits	Septic tanks	1,153	Fort Leavenworth*	Septic tank	.....		
Willows	Septic tanks and public sewer farm	1,139	Le Hunt*	Septic tank	.....		
Winters	Imhoff tanks	910	Overland Park*	Septic tank and filter (not in operation)	.....		
Whittier	Septic tanks and public sewer farm	4,550	St. Johns*	Septic tank	.....		
Yreka	Septic tanks and contact filters	Kentucky:					
Florida:								
De Funiak Springs	.....	.....	Mt. Sterling*	Septic tank	.....		
Fort Myers	.....	.....	Versailles*	Septic tank	.....		
Jacksonville	Massachusetts:					
Key West	.....	.....	North Brookfield*	Broad irrigation	.....		
Lake City	Michigan:					
Live Oak	.....	.....	Harbor Springs*	Septic tank	.....		
Ocala	.....	.....	Holland*	Septic tank	.....		
Orlando	Minnesota:					
Pensacola	.....	.....	Alexandria*	Septic tank	.....		
St. Petersburg	.....	.....	Beaudette*	Septic tank	.....		
Tallahassee	.....	.....	Bovey*	Septic tank	.....		
Tampa	.....	.....	Coleraine*	Septic tank	.....		
Illinois:			Fairmont*	Septic tank and intermittent filtration	.....		
Belleville*	Septic tank	.....	Glenwood*	Septic tank	.....		
Bushnell*	Septic tank	.....	Hallcock*	Septic tank	.....		
Champaign*	Septic tank	.....	Long Prairie*	Septic tank	.....		
Charleston*	Septic tank	.....	Morris*	Septic tank	.....		
Dixon*	Septic tank	.....	Pipestone*	Septic tank and percolating filters	.....		
Downers Grove*	Settling tank and sand filters	.....	Two Harbors*	Septic tank	.....		
Glencoe*	Septic tank	Missouri:					
Highland Park*	Septic tank	.....	Springfield*	Imhoff tank and sprinkling filter	.....		
Jerseyville*	Settling tank	Montana:					
Kewanee*	Septic tank	.....	Hamilton*	Contact beds	.....		
Lake Forest*	Septic tank	.....	Helena*	Broad irrigation	.....		
McLeansboro*	Septic tank	.....	Laurel*	Contact beds	.....		
Mt. Vernon*	Septic tank	.....	Miles City*	Intermittent filtration	.....		
Monmouth*	Settling tank	.....	Red Lodge*	Broad irrigation	.....		
Napierville*	Settling tank	Nevada:					
Newton*	Septic tank	.....	No disposal plants known of.	.....	.....	
Polo*	Septic tank and contact beds	North Carolina:					
Princeton*	Septic tank	.....	Burlington	Septic tank and contact beds.	.....		
Upper Alton*	Septic tank	.....	Charlotte	Septic tank and contact beds.	.....		
Urbana*	Septic tank	.....	Durham	Septic tank and contact beds.	.....		
Winnetka*	Septic tank	.....	Greensboro	Septic tank	.....		
Woodstock*	Septic tank and filters	.....	High Point	Septic tank and contact beds.	.....		
Indiana:			Rocky Mount	Hypochlorite treatment	.....		
Angola*	Tank, contact beds and sand filters	.....	Tarboro	Septic tank and contact beds.	.....		
Bedford*	Tank discharging into a cave	.....	Thomasville	Imhoff tank	.....		
Iowa:			North Dakota:					
Belle Plain*	Septic tanks and sand filters	.....	Mandan*	Septic tank	.....		
Carroll*	Septic tank and sand filters	.....	Minot*	Septic tank	.....		
Cascade*	Septic tanks and sand filters	.....	Rugby*	Septic tank	.....		
Clean Lake*	Septic tank and sand filters	Oregon:					
Corydon*	Tanks	.....	Medford*	Septic tank and filters	....		
Des Moines*	Septic tank and sand filters; two plants	Pennsylvania: †					
Dewitt*	Septic tanks and sand filters	.....	Altoona	Screens and irrigation	1,500,000		
Population by 1910 census.			Brynathyn (Village Association)	Septic tank, primary contact beds, secondary beds, final sand filters and sludge bed	80,000			
Population by 1910 census.			Carlisle	Imhoff tank, sprinkling filters, secondary settling tanks and sludge bed	50,000			
Population by 1910 census.			Chambersburg	Imhoff tank, sprinkling filters, secondary settling tanks and sludge bed	700,000			

Cities operating sewage treatment plants.	General description of plant.	Gallons treated per day.	Cities operating sewage treatment plants.	General description of plant.	Gallons treated per day.
Pennsylvania (Continued)					
Derry	Septic tanks, contact beds and sludge bed.....	500,000	West Chester.....	Septic tanks, contact beds, secondary settling and sludge bed	1,000,000
Devon (Drainage Co.)	Settling tank and irrigation.	25,000			
Dormont	Septic tank and contact beds	170,000	Virginia:		
Doylestown (Sewerage Company)	Settling tanks, contact beds, chlorinated lime treatment and secondary settling basin	100,000	Winchester*	Settling tanks and contact beds .....	...
East Stroudsburg (A. R. Brittan, owner)	Septic tanks and contact filters	30,000			
Enola (Realty Co.)....	Septic tanks and contact beds	35,000			
Hanover (Sewer Co.)	Septic tank, contact beds and chlorinated lime treatment	250,000			
Indiana	Settling tanks, sprinkling filters, secondary tanks and sludge bed.....	900,000			
Lebanon	Imhoff tank, sprinkling filters, secondary tank and sludge bed	250,000			
Nazareth (Sewerage Company)	Settling tanks, contact bed and chlorinated lime treatment	18,000			
New Wilmington.....	Septic tank, sand filters and sand bed	40,000			
Perkasie (Phillip Cressman, owner)	Settling tanks, contact beds and chlorinated lime treatment	150,000			
Pleasantville	Imhoff tank, trickling filter, sand filter and sludge bed.	50,000			
Philadelphia (Pennypack District).....	Imhoff tank, sprinkling filter, secondary settling tanks, chlorinated lime treatment and sludge beds	3,000,000			
Reading	Settling tank, sprinkling filters and secondary settling tanks	6,500,000			
Washington	Septic tanks, sprinkling filters and secondary settling tanks	2,200,000			
Wayne (Sewerage Co.)	Settling tank, primary and secondary contact beds, sand beds and chlorinated lime	700,000			

SEWAGE TREATMENT PLANTS.

(Continued from page 229.)

into inland streams, lakes, etc.; 37 into tidal bays and estuaries, and 9 into the ocean at the coast.

Ninety-eight treat the sewage in some way. Of these, 79 give the sewage preparatory treatment in septic tanks, 6 in Imhoff tanks, 1 in both, 2 in settling tanks and 1 "miscellaneous." The effluents from these preparatory treatments are given final treatment on sewer farms and irrigated land in 46 cases; on contact beds in 3 cases; on intermittent sand filters in 2, by sub-surface irrigation in 1 and by chemical disinfection in 1. Of the 46 having sewer farms and irrigated lands, 29 dispose of the effluent on publicly owned lands, 9 on privately owned lands, 3 on both, and in five cases this information is lacking.

From this it appears that the average population of the municipalities having private sewerage systems is 1,020, and the average population of those without sewerage systems is 1,131; in other words, practically all but the very small communities of the state are supplied with public sewerage systems. Of the 71 municipalities which do not treat the sewage, the average population is 15,000 while of the 99 which do treat the sewage, the average population is 3,490. Of the former, the 9 which discharge directly into the ocean have an average population of 38,611, which is considerably higher than any other class, as might be expected. From this it appears that the smaller cities are in general those which treat their sewage, and that few of those which have the ocean handy give the sewage any treatment before discharging it therein.

Institutional and Private Sewage Treatment Plants in Pennsylvania.

Name	General Description of Plant	Gallons Treated Per Day
Allegheny County Work House, Hoboken Station, Allegheny Co.	Septic tank, sprinkling filter, secondary settling tank and sludge bed	40,000
Blaw Steel Construction Co., O'Hara Twp., Allegheny Co.	Septic tanks, contact beds and sludge bed.....	15,000
Buck Hill Falls Co., Buck Hill Falls, Barrett Twp., Monroe Co.	Septic tank, sand filters and sludge bed.....	50,000
Carnegie Steel Co., West Salem Twp., Mercer Co.	Septic tank, contact beds and sludge bed.....	12,000
Children's Village of the Seybert Institute, Abbington Twp., Montgomery Co.	Imhoff tank, sprinkling filter, chlorinated lime treatment, final settling basin and sludge bed.....	15,000
Dermandy Sanatorium, Morton, Delaware Co.	Septic tank and sprinkling filter.....	4,000
Eastern Pennsylvania State Institution for Feeble Minded and Epileptic, Spring City, Chester Co.	Septic tanks, sand filters and sludge bed.....	160,000
Flannery Bolt & American Vanadium Co., Collier Twp., Allegheny Co.	Settling tanks and chlorinated lime treatment.....	50,000
Glen Mills School, Girls' Dept., Darling, Middletown Twp., Delaware Co.	Septic tank, contact beds and sand filters, and chlorinated lime treatment	50,000
Glen Mills School, Boys' Dept., Glen Mills, Thorndale Twp., Delaware Co.	Settling tanks, contact beds and chlorinated lime treatment	75,000
Haverford College, Haverford Twp., Delaware Co.	Septic tanks, contact beds and sand filters.....	12,000
Home and Hospital of the Good Shepherd, Radnor Twp., Delaware Co.	Settling tank, trickling filter, chlorinated lime treatment and sludge bed.....	4,000
Homoeopathic State Hospital for the Insane, Haver Twp., Lehigh Co.	Septic tanks, sand beds and sludge bed.....	200,000
Inwood Sanatorium, Lower Merion Twp., Montgomery Co.	Septic tank, sprinkling filter, secondary tank and chlorinated lime treatment	10,000

Institutional and Private Sewage Treatment Plants in Pennsylvania (Continued)

Name	General Description of Plant	Gallons Treated Per Day
Lehigh County Home and Alms House, South Whitehall Twp.	Septic tank, contact bed, secondary tank and chlorinated lime treatment, sludge bed	35,000
Masonic Home, Elizabethtown, West Donegal Twp., Lancaster Co.	Settling tanks, mechanical drier and chlorinated lime treatment	17,000
Montgomery County Poor Farm, Upper Providence Twp.	Settling tank, sprinkling filters and sludge bed	20,000
Morrisville Rubber Works, Morrisville, Bucks Co.	Settling tank, sand filter and sludge bed	5,000
Mt. Gretna Park, Mt. Gretna, Lebanon Co.	Settling tank (modified Imhoff), sprinkling filters, sand filters, secondary settling tank and sludge bed	60,000
Nelson Valve Co., Springfield Twp., Montgomery Co.	Septic tank, trickling filter and sludge bed	20,000
N. J. Zinc Co., Palmerton Village, Carbon Co.	Septic tank, contact beds and sand beds	65,000
Northwestern Anti-Tuberculosis League, Bells Camp, Foster Twp., McKean Co.	Septic tank and contact bed	8,000
Norwich Lumber Co., Norwich, McKean Co.	Septic tank and sand filters	75,000
Palmer Land Co., Palmerton Village, Carbon Co.	Septic tank and sand filters	75,000
Pennsylvania Glue Co., Springdale, Allegheny Co.	Settling tanks	20,000
Pennsylvania State College, State College, Center Co.	Imhoff tank, sprinkling filters, chlorinated lime treatment and sludge bed	*400,000
Pennsylvania State Lunatic Hospital Harrisburg, Dauphin Co.	Settling tanks, sprinkling filters, secondary settling tanks and chlorinated lime treatment	150,000
Pennsylvania State So. Mountain Sanatorium, Mount Alto, Franklin Co.	Septic tanks, sprinkling filters, sludge bed and chlorinated lime treatment	130,000
Pennsylvania Training School, Morganza, Washington Co.	Septic tanks, sprinkling filters, secondary settling tanks, sand filters and sludge bed	55,000
Perkiomen Seminary, Pennsburg, Montgomery Co.	Septic tank, contact bed, chlorinated lime treatment and secondary settling tank	18,000
Pittsburgh Municipal Water Works plant, near Aspinwall, Allegheny Co.	Septic tanks and sand filters	6,000
Pittsburgh North Side City Home, Warner's Station, Allegheny Co.	Septic tanks, sprinkling filters, final settling tank and sludge bed	160,000
Philadelphia Jewish Sanatorium for Consumptives, Eagleville, Lower Providence Twp., Montgomery Co.	Septic tank, contact bed and broad irrigation	3,000
Rumpf's Sons', Frederick, Middletown Twp., Bucks Co.	Chemical precipitation and sludge bed	60,000
Rush Hospital for Consumption and Allied Diseases, Country branch near Malvern, Willistown Twp., Chester Co.	Setting tank, contact bed, sand filter and chlorinated lime treatment	5,000
St. Francis Industrial Home, Eddington, Montgomery Co.	Modified Imhoff tank, sand filters and sludge bed	25,000
Schuylkill County Poor Farm and Hospital for Insane, Schuylkill Haven, North Manheim Twp.	Settling tanks, contact beds, sand filters, sludge bed and chlorinated lime treatment	160,000
Soldiers' Orphans' Industrial School, Scotland, Franklin Co.	Settling tank and irrigation	50,000
Somerset County Home and Hospital, Somerset	Settling tank and contact beds	16,000
State Asylum for Chronic Insane of Pennsylvania, Wernersville, South Mountain, Berks Co.	Septic tanks, sprinkling filters, secondary settling tanks sludge bed and chlorinated lime treatment	100,000
State Hospital for Criminal Insane, Farview, Wayne Co.	Settling tank and chlorinated lime treatment	20,000
State Hospital for the Insane, Danville Montour Co.	Settling tanks, sprinkling filters, secondary settling tank, chlorinated lime treatment and sludge beds	425,000
State Hospital for the Insane of the Southeastern District, Norristown, Montgomery Co.	Settling tanks, sprinkling filters, secondary settling tanks, sludge beds and chlorinated lime treatment	200,000
State Institution for the Feeble Minded of Western Pennsylvania, Polk, Venango Co.	Settling tanks, sprinkling filters and sludge bed, chlorinated lime treatment	225,000
State Hospital for the Insane, Warren, Warren Co.	Imhoff tank, sprinkling filters, secondary settling basin, and chlorinated lime treatment	250,000
State Police Barracks, Hempfield Twp., Westmoreland Co.	Septic tank and trickling filter	60,000
Tressler Orphans' Home, Loysville, Perry Co.	Irrigation	20,000
Universal Portland Cement Co., Pennsylvania Twp., Allegheny Co.	Septic tank and contact beds	5,000
Valley Camp Association, Lower Burrell Twp., Westmoreland Co.	Settling tanks and chlorinated lime treatment	5,000
Villanova College, Villanova, Delaware Co.	Settling tank and contact beds	45,000
Warren Water Company, filtration plant, Warren, Warren Co.	Settling tank and sand filter	100
Western Pennsylvania State Hospital for the Insane, Dixmont, Kilbuck Twp., Allegheny Co.	Settling basin, contact beds, sprinkling filters and sludge bed	85,000
White Haven Sanatorium of the Free Hospital for Poor Consumptives, White Haven, Luzerne Co.	Septic tanks, primary and secondary contact beds and sludge beds	18,000
Williamson Free for Mechanical Trades, Middletown Twp., Delaware Co.	Septic tanks, trickling filters and sand filters	30,000
Willow Grove Park, Moreland Twp., Montgomery Co.	Septic tanks, roughing filters, sand filters, chlorinated lime treatment and final settling tank	200,000
Willow Grove Park, Parkside Hotel, Moreland Twp., Montgomery Co.	Septic tank, sprinkling filter, chlorinated lime treatment and final settling basin	500,000
Wood, Allen, Iron & Steel Co., Ivyrock Station, Montgomery Co.	Imhoff tanks, sprinkling filters, secondary tank, sludge bed and chlorinated lime treatment	50,000

* Gallons capacity. Plant just completed and not yet in operation.

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CHANGE OF ADDRESS

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AUGUST 20, 1914.

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SEDIMENTATION TANKS UNDER STREETS.

Ten or fifteen years ago the writer became interested in plans for sedimentation or septic tanks for a city of fair size, which proposed to roof them over and cover them with a few feet of earth, the entire area then to be laid out as a public park. This plan was never carried out, and we believe was not sanctioned by the Massachusetts State Board of Health. A number of tanks of this kind have been roofed over since that time, although experience seems to have indicated that it is much preferable for convenience and certainty of the inspection and operation to leave them uncovered.

Two or three years ago a consulting engineer in New York reported favorably upon a suggestion for placing septic tanks under the streets of that city, but we believe that not many took the idea seriously. It has again been brought forward prominently, however, by the proposition of the New York Sewer Plan Commission (which is composed of the chief engineer of the Board of Estimate and Apportionment and the consulting engineers of the five boroughs) to clarify one hundred million gallons per day of the sewage of Manhattan Borough by sedimentation tanks under the street bordering the East River. In addition to this, sedimentation tanks are proposed at other points, but in smaller units

or in other location than under streets. In making this recommendation the commission affirms that it has "no fear that it will prove impractical or dangerous;" suggesting that any gases arising could be controlled, even to the extent of burning them should this become necessary, and affirming that such basins or screens will be far less objectionable than the present uncontrolled discharge of raw sewage along the shore.

The magnitude of this scheme may be appreciated if we consider the area which it would be necessary to cover. It is generally considered to be good practice to provide a capacity in sedimentation basins of one-sixth the total volume of daily flow. This would require a capacity of sedimentation tanks of two and a quarter million cubic feet. These would require to be excavated entirely below low tide if pumping was to be avoided, as we presume it would be. Owing to the fact that most of this street is made land, that it is cut up with slips and varies in width, we presume that not more than an average of 50 feet in width of street could be used for tanks, with say 10 feet on each side for operating platforms. If we allow 5 feet working depth above the deposit, we find that one and three-quarter miles of tanks would be required; and if we allow for separating walls, inlet and outlet flumes or pipes, etc., it is probable that the structure would occupy two lineal miles of street. As the sedimentation tanks are to be placed at the lower end of the island, it seems probable that this two miles of tanks would be built continuously from the Battery northward.

In spite of the confidence with which the commission speaks, we must confess some grave doubts as to the possibility of preventing a most intolerable nuisance from two miles of continuous sedimentation tanks located under a busily traveled street and within a few feet of occupied buildings. Most sedimentation tanks are in very much smaller units and are exposed to the open air where gases are diluted and generally removed by the freely moving air above as fast as they are formed. Covered tanks have invariably, we believe, been of comparatively small size and located at a distance of at least a few hundred feet from the nearest buildings. Either the enormous amount of sewage contained in these tanks must have fairly free communication with the air above for ventilation, or there must be a number of forced ventilation stations for renewing the air continuously and abundantly. The former would amount practically to exposing to the air of the street a sewer 50 feet wide and two miles long—an idea which we do not believe would be entertained by any civilized city. Forced ventilation means concentrating the discharge of the gas-charged air at a few points, and it is probable that it would be found necessary to burn or otherwise purify the air before so discharging it.

Probably the most serious problem, however, is that connected with the removal of the sludge and final disposition of the same. Owing to the fact that the tanks must be built below tide-water, the use of Imhoff or other two-story tanks, which would require considerable depth, would involve enormous expense and difficulty of construction. But it is questionable whether septic sludge could be handled in such a locality without giving rise to offensive odors, and the final disposition of such sludge in such enormous quantities, without creating both temporary and permanent nuisances, presents a most difficult problem.

It is generally considered that the most objectionable part of a modern sewage disposal plant is the sedimentation tanks, and the most objectionable processes connected with the plants are the removal and disposal of sludge. The proposition to locate such tanks and to

carry on such processes in the very heart of the largest city of the country is one of the most astounding which has come to our notice. Undoubtedly the disposal of New York's sewage will require works of great magnitude and boldness of design. The idea of building an artificial island with sedimentation tanks thereon several miles out in the ocean and carrying the city's sewage thither in a submarine tunnel, at an estimated cost of fourteen million to twenty million dollars (the plan of the Metropolitan Sewerage Commission) was unquestionably a bold one, and some even doubted its practicability. But the operating under the city's streets of sedimentation tanks and sludge removal to clarify one hundred million gallons a day while undoubtedly practical from the financial and construction points of view, is, in our opinion, fraught with danger to the welfare of the city, compared with which the interest on the estimated saving of five million dollars is to be lightly considered.

NEW ORLEANS FORCE ACCOUNT WORK.

Since publishing the article dealing with the work of the Sewerage and Water Board of New Orleans in doing work by force account, on July 16, we have received a report upon this work submitted to that board by Rudolph Hering, George W. Fuller and Harrison P. Eddy. In addition to this, Mr. Fuller and Mr. Eddy appeared before a legislative investigating committee and gave their opinions concerning the matter in reply to questions of this committee. The report and testimony before the committee both substantiate in every point the statements made in our article referred to. Among the statements of the engineers were the following:

"The city of New Orleans is receiving a water, sewerage and drainage service of an unusually efficient character, under conditions of far more than average difficulty, at a cost for each item of service performed that compares favorably with the results obtained from the best managed of other similar public service departments where similarly difficult conditions exist."

"The evidence indicates that the dredging by the board's forces with the land dredges had been done for about one-half the cost of similar contract work."

"If the legislature should decide to discontinue the right of the board to do force account work, it will place the city in the embarrassing position of being obliged to accept the prices bid, whether high or low, or not do the work. Should the bids appear to be too high, the board, of course, can reject them and call for new bids, with a delay of from three to four months. But if the board cannot do the work with its own forces these bids may be practically as high as at first. In other words, the board will be entirely at the mercy of the contractors at times when contractors are busy and bidding high prices, as well as when there is a scarcity of work, and even in case of a combination of bidders to artificially inflate prices."

These opinions were based upon an investigation made by this committee, the details and figures of which were submitted as a part of its report.

In examining Mr. Eddy, the legislative committee asked concerning his experience in Louisville, Ky., and in reply he stated that in the latter part of 1910 bids received for that work were considered too high and the commissioners decided to undertake some of the work by force account, although reluctant to do so because they did not expect to remain in office throughout the construction work. One contract, however, was done by force account and, it was found, for a materially less amount than the prices bid. In consequence of this, the board decided to do other work by force account, in several cases actually taking bids before deciding to undertake a given piece of work. Mr. Eddy believed that in every case where it was possible to make a comparison, the board's force account work was less expensive than contract. In one case the two were about the same.

MARYLAND'S HEALTH APPROPRIATION.

Editor Municipal Journal,
50 Union Square, New York City.

Dear Sir:

In reading the article published in the Municipal Journal on July 16, concerning the water supply and sewage law recently passed by the Maryland Legislature, I note the statement "An annual appropriation of \$25,000 is provided for the use of the Board." It seems to me that this statement may possibly create an erroneous impression. This sum of money was appropriated for engineering work alone. The total annual appropriation for the State Department of Health amounts to \$145,000.

I realize that the sum of \$25,000 yearly is not sufficient to carry on the engineering work as effectively as might be desired, but at the last session of the Legislature an act was passed dividing the state into 10 sanitary districts and providing a district health officer for each. Under the terms of this act \$50,000 annually was appropriated. It was thought unwise to jeopardize the passage of the water supply and sewage law by requesting the appropriation of a sum larger than \$25,000. The main object sought was to have passed a law which would give the State Department of Health sufficient power to remedy unsanitary conditions found in the state, and to have put at the disposal of the State Department of Health a sufficient sum to make a proper beginning. It is hoped that with a judicious expenditure of the money such advances can be made that the Department may justly request a larger appropriation in the future for sanitary engineering work. It is our intention, moreover, to make use of the services of the 10 district health officers, as far as possible, to aid in the collection of samples, investigation of minor nuisances and other work which does not require any considerable amount of engineering knowledge. In this way it is expected that the work of the engineering department may be made much more effective than could possibly be the case if only the annual appropriation of \$25,000 were available. It should be further explained that in this state all chemical and bacteriological examinations of water and sewage are made in the chemical and bacteriological laboratories respectively, and the results furnished to the engineering department for interpretation and use. The laboratories are supported mostly by funds not coming from the \$25,000 appropriated to the engineering department, from which fact it will be seen that a gain results.

It may be interesting to note that a large and expected increase in the force of the engineering department has been made necessary by the passage of the new water supply and sewerage law, and that two resident offices have been, or are about to be, established. One residency has charge of the Eastern Shore and the other of Western Maryland. It is hoped in the future, when funds will permit, to establish two other residencies, one for Southern Maryland, including the district about Washington, and the other for Northern Central Maryland. It has been found that work in those portions of the state distant from Baltimore can be much more quickly and effectively handled by engineers on the ground than from the main office.

The regular force of the Bureau of Sanitary Engineering consists at present of 11 persons—1 chief engineer, 1 principal assistant engineer, 2 resident engineers, 3 assistant engineers, 1 draftsman, 1 engineer-assistant, and 2 stenographers. Besides this force the Bureau from time to time engages temporarily the assistance of extra field men and draftsmen, and it has the regular services of a third stenographer for a portion of each day. Of the engineering force, 6 men are technical graduates—4 of whom, besides the chief engineer, were graduated at the Massachusetts Institute of Technology—and the other employees are well trained in the special lines of work in which they are engaged.

Very truly yours,
ROBERT B. MORSE,
Chief, Bureau of Sanitary Engineering.

UTILIZING CITY SMOKE.

It is reported that a novel method of getting rid of black smoke and at the same time turning it to practical use, is being adopted by several Belgian factories. The smoke is driven by fans into a porous receptacle over which flows a stream of petroleum or similar liquid. The smoke is thus caught and is turned into a gas that gives heat and can be used for running gas engines.

The WEEK'S NEWS

Iowa and Colorado State Highway Work—Widening Salem Streets—Concrete Test Roads—Traction Engine Law—State Commission for Georgia—Water Works Improvements in Louisville, Ky., Asbury Park, N. J., Milwaukee, Wis., Lowell, Mass. and Philadelphia, Pa.—Metering—Fires in Newton, Kans., St. Louis, Mo., Georgetown, Del. and Wausau, Wis.—New Motor Apparatus—Philadelphia's Waste Contract.

ROADS AND PAVEMENTS

Iowa State Highway Construction.

Ames, Ia.—Another convict road workers' camp is to be installed in the next few days under the direction of the state highway commission. This camp will be located at Columbus Junction, Ia., where a mile of concrete paving is to be constructed. The county and citizens have raised \$8,000 to pay for the work. State Highway Engineer T. H. MacDonald, who has charge of the building of the road from Iowa State College north into Franklin township, says that work will be started at once and rushed to completion. A force of men has begun oiling a portion of the Ames downtown streets as an experiment on oiled roads. Methods of putting on oil have been studied by the highway commission the past month and the most modern equipment will be used. About one-third to one-half of a gallon is used to every square foot of roadbed, several such oilings being made before the road is in a perfect condition. Stretches on the college roads and Lincoln highway have been oiled and the experiment has proven successful.

Wider Streets in New Salem.

Salem, Mass.—The rebuilding commission of Salem has decided definitely on the proposed street improvements and the new arrangement will prove of great value to the traveling public. Many important streets have been widened, land being taken from one side of the street or the other to secure the desired result. The burned section of Boston street, which was formerly exceedingly narrow, will be 70 feet wide, and Broad street will be a 100-foot thoroughfare. Broad street, one of the few parked streets of Salem, promises to be an even prettier street than it was before the fire wiped away the western end of this well-made thoroughfare. From Essex street to the edge of the burned area Boston street will soon be a 70-foot street. Congress street promises to be one of the big streets of the city. It is to be widened from a width of something over 40 feet to an 80-foot street. Derby street from Elm to the corner of Orange will be widened to 70 feet. This extension is over the burned area. The Fairfield dock property will be taken. From Lafayette street to Bertram Park, Derby street will be widened to a width of 80 feet. To effect this widening it has been found necessary to take land from both sides of the street.

Concrete Test Roads.

Philadelphia, Pa.—Experiments with a new type of country road is to be made by the bureau of highways. Two stretches of concrete road are to be constructed in sections which ordinarily would call for the macadam type. Chief Connell proposes to expend \$50,000 on two important links of country roads, and he will try concrete.

To Test Traction Engine Law.

Frederick, Md.—An effort made at the session of the Legislature last winter to pass a law permitting any traction engine to use the state roads failed, and the state roads commissions has sent out instructions to country road engineers to enforce to the letter the law against the running of traction engines without smooth drive wheels on the state roads. H. L. Layton of near Kemptown is the first to be arrested following the recent order of the good roads commission. At a hearing he asked that he be allowed to take the case to court and make a test case. Last summer, following the arrest of traction engine operators for running over state roads, there were no convictions. It is said the feeling in the county over the

law is bitter. Owners of traction engines claim that they were always allowed to operate their engines over toll roads, and now that they pay taxes for the building and maintenance of the state roads they should be allowed to run their engines over them. Farmers also claim that they should have a right to have their crops threshed, and it is claimed that the taking off and putting on of cleats is a big job. While the traction engines can be operated over state roads without cleats, yet when the dirt roads are encountered, or the softer ground of the farms, much trouble is experienced. It is also claimed the state roads are generally used for only a short distance.

State Highway Commission for Georgia.

Atlanta, Ga.—The house has passed a bill creating a public highway commission, which shall consist of the members of the state prison commission, the state geologist, the professors of civil engineering at the University of Georgia and the Georgia School of Technology, and one citizen to be appointed by the governor. This board will provide a method of handling Georgia's share of the highway appropriation made by the national congress.

New Circle Highway Being Completed.

Denver, Colo.—A circle highway extending a distance of 230 miles through the heart of the Rockies will be completed during the present summer, according to State Highway Commissioner Ehrhart. Starting from Denver the road leads to Loveland, Estes Park, Grand Lake, over Berthoud Pass, to Idaho Springs and thence back to Denver over the city's system of mountain park highways. There remains about 20 miles of road between Sheep's Lake and Grand River in Middle Park yet to be completed. When finished the "loop" of mountain roads will be one of the most picturesque trips in the state. State convicts are now at work on the Sheep's Lake section. Governor Ammons and Warden Thomas Tynan inspected this work recently.

Concrete Test Road for Mississippi.

Jackson, Miss.—What is said to be the first concrete road let to contract in Mississippi has just been awarded for the building of eleven and one-half miles between Saltillo and Verona. The Board of Supervisors of Lee county let a contract a few days ago for forty-nine miles of good roads over routes already surveyed. The greater portion of these new roads will be macadamized with the best construction of that material. It was decided to build a test road of eleven and one-half miles of concrete, in order that the people of that state might have the opportunity of seeing a concrete road and its advantages.

Colorado to Repair Storm-Damaged Roads.

Denver, Colo.—The state highway commission has apportioned \$20,600 to various counties for emergency work in repairing roads damaged by recent storms and in completing work already begun that must be finished to make roads useful. The apportionment exhausts the funds at the command of the commission for the year. The apportionments include for Larimer county, \$3,000; Jefferson and Boulder counties, \$600; for the Morrison road, \$1,000; Douglas county, \$5,000; Prowers county, \$1,500; Garfield county, \$2,500; Chaffee county, \$1,000; Rio Blanco county, \$1,000; Mesa county, \$1,500. The commission will meet later with the state board of capitol managers in an effort to obtain more money due it from the capitol board. The body has transferred to the commission \$35,000 so far this year out of \$275,000 owed the internal improvement fund.

Muscatine, Iowa, Wants Oiled Roads.

Muscatine, Ia.—Actual demonstrations of oil applications on dirt roads will be made here shortly. A representative of the Austin-Western Road Machine Company of Chicago, is in the city arranging for a demonstration of the machines manufactured by that company for oil spraying. City Engineer C. E. Young, who has been working on the improvement of the dirt roads within the limits of the city, announces that he has perfected arrangements whereby the necessary oil for the spraying will be secured. The demonstration may result in a decision on the part of the city council to purchase modern apparatus. Pressure oil spraying machines may be secured at a cost of from \$350 to \$600 and many Iowa towns of this size have already purchased them. It is figured out that the owner of a sixty-foot lot would be assessed one dollar a treatment and two treatments will make a street dust proof during the entire year.

Discover Valuable Red Gravel Pit.

Beverly, Mass.—A red gravel pit, with thousands of loads but to be uncovered, has been discovered by commissioner of public works James W. Blackmer, at the Longham basin at North Beverly. Up to this year the city has purchased what red gravel it needed of private parties and the money savings will amount to a considerable amount. Longham mine provides a remarkably fine quality of red gravel and there is enough in the hill to last for years. After the discovery an experiment was tried in using the gravel as a covering on streets treated with heavy oil and it worked very satisfactorily. With the success on oil work, the public works department is planning to use the gravel for sidewalks about town. Hundreds of loads have been used by private parties every year in Beverly, for sidewalks, driveways and walks. Carefully raked it makes an attractive walk or drive. Prices run all the way from \$1.50 to \$2 for a single load and \$3 to \$4 for a double load. The pit is some distance from the road but plans are being made for easy hauls and the discovery promises to give many good sidewalks in the city, help out the road work and to save the city considerable money in the course of years.

SEWERAGE AND SANITATION

State Warns City of Unfit Water.

New Albany, Ind.—Dr. J. N. Hurty, secretary of the Indiana State Board of Health, has issued a warning against the use of New Albany city water for drinking purposes. The warning followed a recent analysis made by the State Chemist of samples taken from the reservoir of the New Albany Water Company and from the Ohio River at a point where the supply for the city is obtained. The raw water taken from the Ohio River contains the sewage of Louisville, Jeffersonville and other cities immediately above. This sewage-laden water is liable to contain the germs of typhoid fever, dysentery and other intestinal disorders. The treatment which is given this water after it is taken from the river is very inadequate and tests made by the Indiana State Board of Health show that the water has not been purified properly. Even after such treatment and purification as is now employed the water may yet contain the germs of typhoid and other intestinal disorders.

Fire Engine on Outlet Pipe Repair.

Asbury Park, N. J.—The repairing of the break in the sewer outlet at Avon, which resulted when the river inlet, diverted from its course by the contractors at work on the concrete bulkhead undermined the outlet pipe and caused it to sag, has been completed. For the greater part of a day the borough's fire engine was in service pumping water into the closed outlet to force out the sand which was washed into the pipe and filled it solid for a length of 310 feet. To the end of a hose from the engine an inch-and-a-half iron pipe was coupled and extended into the sewer pipe. As the outlet was cleared new lengths of pipe were coupled on, until finally the obstruction gave way with a great burst of mud and sand from the ocean

end. The engine was kept at work for three hours after that in order to insure that the outlet was perfectly clean.

Typhoid Epidemic Ended.

Thorsby, Ala.—This town has just been given a general cleaning, an epidemic of typhoid fever for the past two months having aroused the people. The first work was to discover the source of typhoid infection which proved to be "open wells" receiving drainage or seepage from unprotected water closets accessible to flies. To prevent further contamination of food or water from this source the town council passed an ordinance requiring all water closets to be provided with "dry pail system" and to be made fly proof. There have been no deaths from typhoid fever and no recent cases at Thorsby.

State Must Approve All Improvements.

Des Moines, Ia.—The approval of the Iowa state board of health will be necessary for municipal improvements in the future. City engineers have received a communication from the state board which contains information as to the new provisions relative to municipal improvements, it is provided that when any city contemplates water supply, garbage or sewerage improvements that the plans must be submitted to the state board and the approval of that body awaited before the improvement is made. In the past no state supervision has been necessary but the new regulations make this imperative.

WATER SUPPLY

Louisville's New Filters in Operation.

Louisville, Ky.—Eleven new filter beds, which make the daily capacity of the Crescent Hill station 72,000,000 gallons, have now been put in complete operation. The new beds just double the filtering capacity. The record use of water for twenty-four hours was during two hot days last month, when 54,000,000 gallons were consumed daily. This proved a heavy drain on the reservoir reserves and had it continued raw water would have been pumped into the mains, as it was possible at that time to filter only about 36,000,000 gallons daily. Pure filtered water sufficient for any emergency can now be turned into the clear water reservoir every twenty-four hours. The new beds cost about \$150,000 and were started a year ago. The Louisville Water Company now has a surplus of about \$300,000 on hand. Improvements costing about \$1,000,000 are being contemplated and will probably be voted from year to year. The principal improvements are: a new river pumping station and machinery, \$500,000; new 48-inch main following the general direction of Eastern and Western Parkways and forming a new water belt line south of Oak street, \$300,000; additional pumping machinery at the filter station, \$180,000. These three big projects alone call for an expenditure of \$980,000. After they have been completed President W. O. Head says engineers inform him that it will be necessary to spend very little money on the plant for a period of at least twenty years, during which time water rates can either be reduced or a dividend declared to the city and used in lowering the tax rate and building streets and sewers. With the surplus on hand it will take about three more years to pay for the big projects mentioned.

Low Supply Follows Waste.

Doylestown, Pa.—The Doylestown Borough Council is discussing the dangerously low condition of the water supply. The water committee reported that the supply at the works was lower than it had been for several years, the pumps are kept running from 4 o'clock in the morning until 9 o'clock in the evening and it was difficult to keep up the necessary supply, owing to the drying up of the streams and the artesian wells not giving their usual output. Members of council stated that there was a waste of water all over the borough. Some property holders, it was reported, commence early in the morning to sprinkle streets in front of their premises and keep on doing so all day. This was the case in some sections where the streets had been oiled. The water committee reported that the large artesian well was not doing good service.

Trouble with Electrolysis.

Haverhill, Mass.—Water pipes and connections on Water street, where the street department is completing the repaving, were found by the water board to have seriously suffered from electrolysis due to the close proximity of the rails of the Bay State Street Railway Company. It became necessary for the water board to replace practically all of its connections on the thoroughfare because of the electrical destruction of its system. It is thought that the trouble on Water street is due to the fact that the thoroughfare is so near the river and because the wires of the street railway company cross the Merrimack where they are exposed to the action of the water. The difficulty appears to be a local one. The water board has taken up the matter with the street railway company and the engineers of the company are studying the subject. The damage to the water service has amounted to considerable but no definite figure could be given out at the water board office. No bill for the expense of re-establishing the damaged connections has been sent to the street railway company by the water board, but the subject has been discussed between representatives of the two corporations.

City Wins Water Suit.

Johnson City, Tenn.—Court of civil appeals held at Knoxville has decided the case of Unicoi County et al. vs. Johnson City in favor of the latter. Unicoi county and certain property owners along Indian creek sought to enjoin Johnson City from diverting the Big Blue Springs and the Wright springs from Indian creek to Johnson City as the source of its water supply, upon the grounds that Johnson City did not have the power to condemn water and riparian rights beyond the limits of Washington county, and also upon the grounds that diverting the water from the channels of Indian creek would endanger the health of the people, ruin the farm lands and destroy power sites.

New 2,000,000-Gallon Pump Installed.

Asbury Park, N. J.—A giant Deane Triplex pump, with a 2,000,000-gallon capacity, part of the \$25,000 improvements which the Monmouth Water Company is making to its plant at Jumping Brook, Neptune township, has just been installed. Besides the pump, which will triple the present pumping capacity of the Monmouth company's plant, the company is also installing a new 100 horse power gas engine, to drive the big pump, a 150 horse power gas producer, a centrifugal pump to draw the water from the wells and three smaller auxiliary engines. Workmen operating under the direction of Superintendent Charles A. Buck are already busy assembling the pump's parts at the plant and it is expected that the work will have been completed in two weeks. The foundations for the big pump, which was made by the Deane Pump Company of Holyoke, Mass., and New York City, have been laid. No addition to the plant building was necessary because of the improvements, it having been built originally with view to permitting the addition of the extra machinery.

Concreting Water Crib.

Milwaukee, Wis.—The big steel tub which is to form the crib through which the city's future water supply will be drawn has been floated out from the Kinnickinnic river and towed out into the lake behind the breakwater off McKinley beach where the construction will be continued until it is ready for sinking in its permanent location 4,000 feet from the short shaft in Lake park. The crib is sixty feet high and sixty feet in diameter and the steel work weighs 400 tons. It is now drawing eighteen feet of water, and will be filled with concrete and material till it draws about thirty feet when it will be ready for sinking. There is an inner shell eighteen feet in diameter and the concrete is filled between the two walls of steel, leaving the middle tube open for the volume of water that will pour through the crib from two six-foot pipes that will extend 2,500 feet further into the lake and get the water supply through submerged cribs. In a short time the crib will be ready for sinking, and it will then be towed to the permanent location and the valves will be opened that it may fill with water and sink. The filling between the walls

with concrete will then be continued and finally the crib will be capped with a roof. It will stand in forty feet of water with the six-foot valves on the bed of the lake and will project fourteen feet above the surface. It will cost about \$100,000 completed. The tunnel from the shore shaft under construction for more than a year is more than half way to the crib location, and after the crib has been placed the tunnel contractors may decide to dig the lake shaft from the crib and then tunnel shoreward to meet the other bore.

Meter Basis for Douglas, Ariz.

Douglas, Ariz.—Every water user in the city of Douglas, whether using 2,000 or 50,000 gallons per month, will hereafter stand upon an equal footing, insofar as metering is concerned, according to a recent decision reached by the water commission. While most of the city was metered previously, a few large users of water have been paying a flat rate monthly. The commission decided that the use of meters was fair for all and therefore voted unanimously to compel everyone to install a meter and pay for water according to what the meter readings show.

Begin Work on Lowell Filter Plant.

Lowell, Mass.—Inspector Weston, of the state board of health, came to Lowell for the purpose of taking samples of water from the 24-inch main laid on the bed of the Merrimack river near the Aiken street bridge. The state board took samples about two weeks ago and Mr. Weston stated that the samples proved all right, but that the board had determined to take other samples in order to confirm the original test. It was found, he said, that no bacillus coli were present in the samples. After the state board has reported orders will immediately be given for the pumping of water through the big main. Two weeks ago the water was pushed through the pipe from the northerly end, near Ferry lane, and here three samples were taken. Because the manhole near the abutment at the southerly end of the Aiken street bridge was covered with river water, it was found necessary to insert a pipe, and the water which had been forced through at the northerly end under a 72-pound pressure, came out at this point where a sample was taken. Commissioner Carmichael has stated that he expects to break ground for the new filtration or purification plant at the boulevard immediately—just as soon as the money, borrowed by the city council, is available. He has made arrangements for the early delivery of all material necessary for a good beginning.

Will Install Meters.

Aberdeen, S. D.—Owing to the persistent waste of water by consumers, the city commissioners are considering the advisability of installing water meters. Heretofore consumers have been permitted to use all the water they needed, under certain restrictions as to size of hose and other conditions, but the waste during the summer months has become great and meters will probably be installed.

Burst Main Washes Out Road.

Johnstown, Pa.—The bursting of a pipe line leading from the Manufacturers' Water Company dam at Border, along the Windber trolley line, interrupted through traffic on the line for nearly eight hours, it being necessary to transfer passengers around the washout. An immense hole was washed from the road and from beneath the car tracks, which were trussed up so that traffic could be resumed. Workmen filled up and replaced the ballast. When news of the break was telephoned to the Quemahoning dam, water from which had been turned into the Border dam main, was shut off at the reservoir. Several hours were required to drain the pipe, however.

New Well Gives Only Sand.

Kimball, S. D.—With \$13,000 invested in a new water system, this city is as short of water as it was eight months ago when the larger part of the investment was made. For two weeks the new city well had been giving up plenty of sand, but very little water. Investigation developed that the unusual strain on the plunger in the pump cylinder had parted the rods. Attempted repairs were unsatisfactory.

Sea Wall Causes Water Works Trouble.

Sacramento, Cal.—The forty-inch suction pipe at the City Water Works had to be discontinued for a short time because no water was being drawn in. Insufficient water to supply the entire city was furnished by the two remaining pipes and water did not reach some sections of the city for a few hours. This is the third time in the last month that trouble has been experienced at the Water Works as the result of the suction pipes going out of commission. Two weeks ago the eighteen-inch pipe broke, but this one has been repaired and at present two pipes are being used to draw water from the river. Commissioner of Public Works Thomas Coulter claimed this trouble with the suction pipes is due to the new seawall, which he says is settling toward the river and is forcing the big pipes to such an extent that they are cracked or in some other manner damaged. The additional pumping outfit, with a 15,000,000 gallon capacity, which was installed at a cost of \$17,000, will be ready for use shortly. Engineer Ehret says that with this new unit the water works will have a capacity of 37,000,000 gallons per day from five suction pipes.

To Study Water Plants.

Billings, Mont.—Mayor Leavens, City Engineer Durland and Alderman Snidow have left for a ten-day trip to Missouri and Kansas cities to make a study of water purification plants. They expected to make their first stop in Kansas City, where they will confer with Burns & McDonnell, the consulting engineers who are drawing the plans for the Billings water plant.

New Stack for Torresdale Plant.

Philadelphia, Pa.—While the Torresdale Pumping Station was closed down for three hours necessary connections between the boilers and the new 250-foot radial brick stack, recently completed, were made. The stoppage of pumps for the short time did not affect the water supply. Workmen today have begun the difficult task of razing the concrete chimney erected several years ago. This stack has deteriorated to such an extent that it has been pronounced unsafe by expert engineers. The new stack replaces it. According to Chief Davis the new chimney is a complete success. No one was injured during the operation of changing flue connections, but several workmen were affected by the gases which came from the old stack when connections were broken. The new chimney, erected by the Alphonse Custodis Chimney Construction Company, 99 Nassau Street, New York City, cost approximately \$19,000.

STREET LIGHTING AND POWER

Drouth Closes Light Plant.

Lagrange, Ky.—The electric light company has been forced to discontinue service on account of lack of water to supply the plant. The large spring, known as the "Public Spring," which has held out through previous drouths and which supplies all the stock water for the town and vicinity, also the water for the plant, is dry.

Wachusett Dam Profitable.

Boston, Mass.—That the water plant at the Wachusett Dam of the Metropolitan water system is proving an excellent investment for the Metropolitan water district is shown in the annual report of Dexter Brackett, chief engineer, recently published in book form by the State. The investment in the power plant is less than \$150,000, which does not include the expense of dam and reservoir but as the power is entirely a by-product the net income on the approximately \$150,000 may be figured as the net on the total investment. Mr. Brackett's report shows that after the payment of all expenses incident to the operation of the hydro-electric plant there remained \$24,106. The hydro-electric power station was operated on 276 days during the year, and nearly all of the electric energy developed was delivered to the Connecticut River Transmission Company under a five-year contract, which went into effect on October 2, 1911. The daily output has varied from the minimum amount which the Transmission Company is required to take under its contract to the full

capacity of the plant, which is about 70,000 kilowatt hours when the generators are operated continuously. The plant has operated satisfactorily and there have been no interruptions worthy of note. The following are the statistics relative to the operation of the station:

Quantity of energy sold to Connecticut River Transmission Company (kilowatt hours).....	6,098,729
Quantity of energy used at power station (kilowatt hours)	14,278
Quantity of energy used at sewerage pumping station (kilowatt hours).....	113,928

Total quantity of energy generated (kilowatt hours)	6,226,935
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Quantity of water used (gallons)	28,527,600,000
Average effective head (feet).....	90.6
Kilowatt hours generated per million foot gals....	2,409
Efficiency of station (per cent.).....	76.7

Earnings:

Energy supplied Connecticut River Transmission Company at \$5.30 per thousand kilowatt hours... .	\$32,323.28
Labor supplied Connecticut River Transmission Company	93.50
Energy supplied power and sewerage pumping stations, credited at \$5.30 per thousand kilowatt hours	679.49
	\$33,096.27

Cost of operating station:

Labor	\$5,375.26
Fuel for heating building.....	94.03
Repairs and appliances	363.72
Oil and waste.....	51.79
Small supplies	129.95
Taxes	2,975.00
	\$8,989.75

Total earnings	\$33,096.27
Cost of operating station.....	\$8,989.75

Net earnings	\$24,106.52
Net earnings per thousand kilowatt hours generated	\$3.87

Utility Company Gives Up Franchise.

South Bend, Ind.—The Indiana & Michigan Electric Company will surrender its franchise to the city and in lieu thereof will accept an indeterminate permit, as provided under the public utilities act, according to F. A. Bryan, general manager of the electric company. Similar steps will be taken in Mishawaka and Elkhart, where the company also operates. City officials, in commenting on the matter, were under the impression that the action was taken on account of the recent agitation to have franchises taxed. The last general assembly of the legislature provided that any public utility operating under an existing license, permit or franchise shall, upon filing at any time prior to the expiration of such license, permit or franchise prior to July 1, 1915, with the city clerk, a written declaration that it surrenders such license, permit or franchise and in lieu thereof can accept an indeterminate permit; and such public utility shall hold such permit under all the terms, conditions and limitations of the act. The public utility in accepting the indeterminate license must by acceptance of such permit be deemed to have consented to a future purchase of its property by the municipality under the terms and conditions determined by commission as provided by law and shall thereby be deemed to have waived the right of requiring the necessity of such taking to be established by the verdict of a jury, and to have waived all other remedies and rights relative to condemnation, except such rights and remedies as are provided in the act and shall have been deemed to have consented to the revocation of its license, permit or franchise by the commission for cause.

FIRE AND POLICE

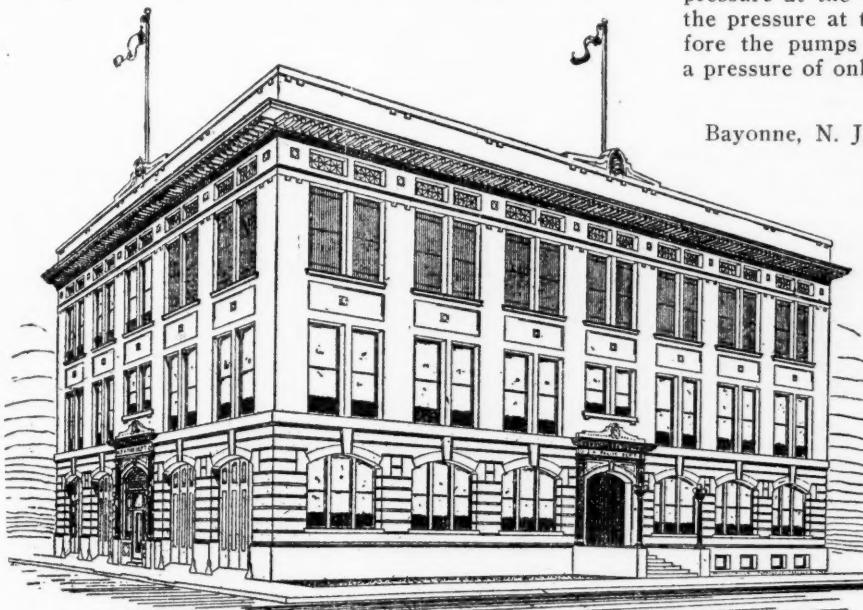
Newton, Kans., Business Section Burns.

Newton, Kans.—Fire, starting from an unknown cause at an early hour destroyed practically the entire block of business buildings on the east side of Main street and occasioned a loss of nearly \$350,000. The fire department was helpless to control the flames, and only a shift in the slight breeze which was blowing at the time saved the entire business section of the city from destruction. A lumber yard, a theatre and many stores were left in ruins. Fire Chief A. G. Waldron, of Wichita, who came here in charge of the engine which was sent from Wichita said afterward that Newton needs more fire-fighting equipment. It needs at least one more engine and a good hook and ladder truck. It needs a new and larger high pres-

sure water main from the pumping plant into the city and adequate sized fire mains and plugs. There is much talk, since the fire, regarding the immediate authorization of the construction of a new supply main from the pumping plant at Mission to the city, new fire mains and hydrants along Main street, additional equipment for the fire department, and the enlargement of the fire department itself.

New Fire and Police Station at San Antonio.

San Antonio, Tex.—The provisional plans for the new central fire and police station, drawn by E. T. Jackson, city building inspector, are for a three-story building fronting 112 feet and 80 feet deep. The first floor will be divided between the fire and police departments. The fire equipment, the fire chief's private offices, and the firemen's lounging room will face one street. The police department will have rooms for the police chief, the captains, the sergeants, the matron, besides a general consultation room. The detective department will include a room for the chief of detectives, one for the Bertillon system, and a general consultation room. The second floor will be divided between the firemen's dormitory on the east side and the Corporation Court on the west, with a room for the Hu-



SAN ANTONIO'S NEW FIRE AND POLICE STATION.

mune Society on the west side. The third floor will embrace the jail. The basement will include the police assembly room and store rooms for the fire and police departments. The building will be set back from the street ten or twelve feet to allow for a space in front for grass and flowers. On top will be a training tower for the firemen. The back yard will be divided between the police and the firemen. Physical exercises for the policemen and drill equipment for the firemen will be located there. The building may cost \$80,000.

Hose Throws Firemen from Water Tower.

St. Louis, Mo.—One fireman was killed and several were badly injured when a high-power hose worked itself loose and hurled the men who had held it off a water tower at a blaze in the retail district. The fire was discovered shortly after 6 o'clock in a six-story building occupied by several manufacturing concerns. A few minutes before several hundred girl employees had left the building, and it is believed no one was caught in the flames.

Fight Hard Fire in Georgetown, Del.

Georgetown, Del.—Despite rotted hose and incomplete apparatus, Georgetown volunteer firemen saved the entire town from burning when the entire business section caught fire. The loss was heavy. Calls for aid were sent out and the Lewes firemen arrived in their automobile truck in time to help, covering the sixteen miles in twenty

eight minutes. A train crew saw the flames at Redden, four miles away, ran their train to Georgetown and blew the first alarm.

Wausau, Wis., Water Works Burned.

Wausau, Wis.—The pumping station of the Wausau water works burned, entailing a loss of \$8,000. The city supply has been cut off until repairs were made.

MOTOR VEHICLES

Test New Truck for Wilson, N. C.

Wilson, N. C.—The new auto fire truck just arrived from the American-La France Company has been tested. The truck is a hundred horsepower machine with a pumping capacity from direct pressure of 700 gallons per minute and 125 pound nozzle pressure. The price paid for it was \$9,000. After a run around the city and several miles into the country at a varying speed of from 20 miles an hour up, the truck was tested for throwing water. Three lines of hose connected were found to be carrying respectively 270, 345 and 275 gallons of water per minute, a total of 890 gallons of water per minute while the total pressure at the end of the nozzles was 260 pounds, while the pressure at the pump ranged around 140 pounds. Before the pumps were put to work the indicator showed a pressure of only 40 pounds.

New Tractor Tested.

Bayonne, N. J.—The Cross automobile tractor made by C. J. Cross & Co., 1874 Broadway, New York City, fitted to the aerial truck of the Fire Department has been given a thorough test. All the tests proved satisfactory and the fire committee, who were present, feel satisfied that it will meet the requirements of the specifications. The hardest test was when the big truck ploughed through the sand six and eight inches deep and up the steepest hill in the city without showing the slightest sign of feeling the heavy load. The biggest advantage that the truck has shown over the old method of handling is in the raising of the ladder, which is operated by the motor. When the truck was drawn by horses the ladder had to be raised by hand and it took five times as long to raise it as it does by motor power. Among those present at the test were Councilman John J.

Boyle, John F. Driscoll and John A. Feczko of the fire committee, President of the Council John P. Smith and Councilman Neil O'Mahony and Robert J. Talbot. The fire committee will undoubtedly approve of the apparatus and have it placed in commission. The three horses that drew the apparatus will be turned over by the fire committee to the Street Department.

Try Out New Combination.

Cincinnati, O.—At a three-day outing of the Cincinnati firemen at Chester Park, under the patronage of Mayor Spiegel, a brand new Ahrens-Fox combination automobile chemical engine was tried out at the lakeside as a feature of the program. The machine was manned by a volunteer crew from the firemen. Other features of the day's program included exhibition of ladder climbing, hose coupling, harnessing horses, etc.

Motor Truck Accepted.

Nashua, N. H.—The Seagrave motor truck that has been tried out by the city for the past three weeks has been officially accepted by the fire commissioners and ordered into service. For the present Chief Whitney will study the manning of the big truck to find out the number of men required to work on it. Capt. Albert C. Melandy will have charge of the company and vehicle and Driver Jeremiah Coffey will be the chauffeur. The new motor truck will be known as Motor Chemical No. 1.

Newark's New Chemical.

Newark, N. J.—The new chemical automobile apparatus of the East Orange Fire Department, which will be located at headquarters has arrived from the American-La France Company factory. With the tractor recently installed at headquarters the chemical apparatus cost the city \$10,750. The old horse-drawn chemical wagon will be used by Company No. 3.

Lynn's New Truck.

Lynn, Mass.—Fire service in the Glenmere district has been improved 40 per cent. since the motorizing of truck 4, located at the Chestnut street engine house. The apparatus, which formerly was drawn by three horses, is now motor drawn. A Knox-Martin tractor was put on the kit in Providence. The apparatus is a city service Seagraves truck. It carries two 25-gallon chemical tanks and was purchased by the fire department in 1908. Under good conditions the truck will make anywhere from 28 to 30 miles an hour.

GOVERNMENT AND FINANCE

Trenton's Finances Sound.

Trenton, N. J.—For the first time in years, the city government of Trenton is paying its way. The report of Director of Revenue and Finance Edward W. Lee, submitted to the City Commission, showed that the assets of the city amounted to \$14,700,000, nearly \$7,000,000 more than the liabilities. The report called attention to the economy that was necessary to make this showing and advised against a too liberal policy in connection with public improvements.

Mayor Arrested for Use of Cross.

Racine, Wis.—Mayor Walter Goodland and City Clerk Charles Ryba were placed under arrest by a United States marshal charged with having violated the law against using the Red Greek Cross, which is used by the army and navy. This city has used the red cross on its police ambulance, on the sleeves of the health officers and on anti-spitting signs.

To Vote on New Charter.

San Angelo, Tex.—The petition asking the City Council to call an election to decide whether or not a new charter shall be written for the city has been signed by over 10 per cent. of the voters, more than enough to make the calling of the election compulsory. If a majority of the voters vote in the affirmative a commission of fifteen men will frame a charter to be voted on, article by article, at a second election. The city now operates under a statutory charter. Three years ago the proposition to adopt the commission form was defeated.

Seek to Force Mayor to Sign Franchise.

Woodbury, N. J.—City Council has instructed City Solicitor Davis to proceed with mandamus proceedings against Mayor Cattell with a view to compelling him to sign the electric light ordinance, which gives a five-year contract to the Public Service Corporation for lighting the city and which the Mayor refuses to sign. Neither will he resign as Mayor so that another official may be appointed, thus holding up the execution of the contract. The Mayor also refuses to turn over the keys of his office, and proposes to hold his position until the end of his term if possible.

City Council then obtained from Supreme Court Justice Garrison a rule to show cause why Mayor M. F. Cattell should not approve the street lighting contract as adopted by Council, the writ being returnable September 17. Mayor Cattell has refused to sign this contract, stating that he promised the people when elected

that he would not sign any five-year contract with the Public Service Corporation. The Mayor returned the \$60,000 water bond ordinance to Council without his approval, stating that he believed the city would have trouble in floating the bonds.

STREET CLEANING AND REFUSE DISPOSAL

Philadelphia Annuls Waste Contract.

Philadelphia, Pa.—After an experiment of four months with the scheme to sell city waste collected by the street-cleaning contractors, the plan has failed because the contractors defaulted in payments. There was an additional payment of \$3,000 just due from the Waste Product Company, already in arrears by \$5,000, and upon learning that no money had been received, City Solicitor Ryan took the action necessary to have the contract annulled and the surety sued for the \$5,000, the amount of the bond. Last week Controller Walton sought advice from Mr. Ryan as to the defaulting company, and now he has directed Chief Connell, of the Highway Bureau, to annul the contract and readvertise it, and also notified the Controller that he would begin the necessary action to sue out the bond and recover the money for the city. The contract, made in April, was for \$30,000. The company met the initial payment of \$500 in April, \$1,500 in May, but failed to pay the installments of \$2,500 each for June and July, and that of \$3,000 just due. The city will have recovered \$7,000 altogether when the amount of the bond is collected. Chief Connell has announced that he will readvertise the contract, bids to be received within 10 days. The refuse will be delivered to the city dumps and there burned until a new contract is entered into. The Waste Product Company was organized to take over the present contract. The company was limited as to its capital and did not install the labor-saving devices, according to Chief Connell, that would have obtained profits for the company. Chief Connell still clings to the belief that the contract will prove a profitable one to both the city and the individuals who undertake the work.

The Cost of Street Flushing.

Richmond, Ind.—President Bavis of the board of public works has submitted a report of the street department for the month of July, the principal feature of which was the fact that it cost an average of \$11.30 a mile to flush the paved streets, 26 miles having been flushed, making the total cost \$252.15. The cost of this work was \$1.62 more a mile than during the month of June and five miles less streets were flushed. All this was due because of the vast amount of dirt hauled over paved streets last month, requiring more laborers and more water to keep them in condition. There were 1,073 loads of ashes hauled in July at an average cost of 67.1 cents a load and a total cost of \$720.20. The expenses for other work last month were: Cleaning sewers, \$145.20; street repairing, \$854.57; cleaning gutters, \$24.22; dumps, \$92.60; cutting weeds, \$73.00; operating street roller, \$63.16; oil inspector, \$49.60; work on public buildings, \$10.40; fountains, \$1.12.



Courtesy Lynn (Mass.) Daily Evening Item.
TRUCK MOTORIZED FOR LYNN'S SERVICE.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Establishment of Highway—Defective Proceedings—Estoppel.

Kansas City v. Burke et al.—A dedication of a highway may be shown by acts of estoppel on the part of a land-owner, and where the proceedings for laying out a highway by the public authorities are defective, but it is shown that the owner of the land through which the road was attempted to be laid out signed the petition, was present with the viewers when they viewed the road, made a claim for damages and accepted the amount awarded, fenced his land on one side of the road, and for years thereafter acquiesced in its improvement by the road overseer, he is estopped from contesting the validity of the highway, and his acts followed by user will constitute a dedication.—Supreme Court of Kansas, 141 P. R., 562.

Special Assessments—Sidewalks—Ordinance—Validity.

City of Chicago v. Edens.—An ordinance providing for a special assessment for the construction of a sidewalk, which provided for the construction of fills or grades, the filling to be done with earth, but made no provision for a retaining wall of frame or embankment, was invalid; since, under such ordinance, a property owner could not avail himself of the right given by the ordinance to construct the walk himself, as he could not know what would be a compliance with its terms.—Supreme Court of Illinois, 105 N. E. R. 730.

Special Tax Proceedings—Tax Against Railroad Property.

City of Kankakee v. Illinois Central Railroad Co.—In a special tax proceeding the question of the proportionate share of the cost of the improvement as between different tracks of land cannot be tried, and an objection filed by an owner of land that its property was taxed more than its proportionate share is properly stricken out. The property of a railroad company devoted to business uses may be taxed for a local improvement to the amount of the enhanced value of the property, though the grant to the company restricts the use of the land to railroad purposes. Where land of a railroad company is used only for its tracks used in transportation, there is no enhanced value of the land from the improvement of an adjoining street by the construction of a tile subdrain on each side of the street and a storm sewer on part of the street, and the land cannot be taxed for benefits therefor. Where a part of a railroad right of way adjoining a street improved by the construction of a tile subdrain and a storm sewer is not benefited thereby, while another part devoted to business uses is benefited, it is not improper to tax the whole right of way in the amount of the benefit instead of dividing the right of way in levying the tax for benefits.—Supreme Court of Illinois, 105, N. E. R. 731.

Taxation—Defective Notice—Estoppel.

Catts v. Town of Smyrna.—A landowner, who stands by and allows a municipality to lay pavement which he was required to provide, cannot, after the pavement has been constructed, defeat the assessment on the ground that the notice given him by the municipality was defective, having concealed the defect and allowed the municipality to proceed; but where the improvement was not laid as required by statute, and the defect was not apparent on inspection, the owner was not estopped to attack the assessment on that ground.—Court of Chancery of Delaware, 91 A. R. 297.

Duty of Water Company—Franchises—Contracts.

Montana Water Co. v. City of Billings.—Where a city granted complainant a franchise to furnish water to the city and its inhabitants, complainant owed to the community a continuous duty to supply pure and wholesome water, and the city was bound to see that such duty was performed, and if complainant failed to perform for other and unforeseen causes, or failed to promptly repair de-

fects due to such causes, it was the city's duty to compel full performance, or to avoid the franchise or contract, or both. Where a city ordinance granted to complainant water company a franchise conferring on it the right and duty to occupy for an indefinite time the streets of the city with a water system, and to vend pure and wholesome water to the city and its inhabitants if they desired to buy, and also contained a contract for 20 years to sell water to the city, which was obligated to buy at specified rates, and also to purchase complainant's system at the end of the term or renew the contract for a similar period, the franchise and contract were separable, and the fact that the city failed to perform its obligation under the contract to buy the system, or renew the contract, did not estop it to claim a forfeiture of the franchise because of complainant's failure to furnish pure water and an adequate pressure and supply.—District Court of Montana, 214 F. R. 121.

Monopolies—Municipal Gas Franchises—Validity.

City of Wheeling v. Natural Gas Co. of West Virginia.—A franchise ordinance given a natural gas company by a municipal corporation to use its streets, alleys and public grounds for supplying natural gas for heating purposes, and conditioning the same that gas shall not be sold through the pipes of such company for lighting purposes in competition with gas manufactured by it, does not operate to create a monopoly in favor of such municipality in the manufacture and sale of manufactured gas, inhibited by any rule of law or rule of public policy. The rule appears to be different in those states where public service corporations derive power and right to serve the public in a particular way, not from the municipality, but from the constitutional or statutory law, and requiring only the consent of the municipality to occupy its streets, alleys and public grounds for such purposes.—Supreme Court of Appeals of West Virginia, 82 S. E. R. 345.

City Solicitor—Extra Services—“Professional Acts.”

May v. City of Auburn.—Under city ordinances providing that the city solicitor should be an attorney and counselor at law and should act as the legal adviser and solicitor of the city, except where the city council authorized or required him to secure the service of additional counsel, that no money should be paid from the city treasury for legal advice or services, except as expressly authorized thereby, and that the city solicitor should do all professional acts incident to the office or which might be required of him by the mayor, city council, or either branch thereof, the city solicitor was not entitled to compensation in addition to his stated salary for preparing a bill authorizing the city to acquire or control private cemeteries by purchase or eminent domain and presenting the matter in behalf of the city before a committee of the Legislature pursuant to a vote of the city council, since such services were not such as a layman would ordinarily be employed to perform for others and were therefore “professional acts,” which the city solicitor was required to perform, especially where the vote of the council designated him as city solicitor and not in his private capacity, and he at the time did not notify the council that such acts were not within his official duties.—Supreme Judicial Court of Maine, 91 A. R. 177.

Paving Contract—Construction—Acceptance.

City of New York v. Continental Asphalt P. Co.—A street paving contract required the contractor to maintain it in good condition for five years after completion and acceptance. The contractor, after completing 97 per cent. of the work, was delayed a year on the remaining part because the city permitted abutting owners to obstruct the street by building operations. Held that, as the contractor was delayed through no fault of his own, the five-year period as to the 97 per cent. would run from the completion thereof, and not from the completion of the whole work. Where a city contracts for the repair of a street, there is an implied obligation upon its part to give the contractor access to the place at which the work is to be performed.—Supreme Court, Appellate Division, 148 N. Y. S. 436.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Aug. 18, 19, 20.
FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK.—Geneva, N. Y.

AUG. 25-27.
CENTRAL STATES WATER WORKS ASSOCIATION.—18th Annual Convention, Windsor Hotel, Wheeling, W. Va. Secretary, R. P. Bricker, Shelly, Ohio.

Aug. 26-28.
VIRGINIA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Portsmouth. President, Chief Walker.

Sept. 1.
PACIFIC COAST ASSOCIATION OF FIRE CHIEFS.—Annual Meeting, Vancouver, B. C. Exhibition of apparatus, August 28, San Francisco.

Sept. 2-4.
NATIONAL ELECTRIC LIGHT ASSOCIATION. New England Section. Annual Convention, Narragansett Pier, R. I. Chairman Entertainment Committee, E. A. Barrows.

Sept. 9, 10, 11.
NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION.—Eleventh Annual Convention, Buffalo, N. Y. Will P. Blair, B. of L. E. Bldg., Cleveland, O. Secretary, D. H. MacDonald, Assistant Secretary.

Sept. 9-11.
NEW ENGLAND WATER WORKS ASSOCIATION.—Annual Convention, Boston, Mass. Secretary, Willard Kent, Narragansett Pier, R. I.

Sept. 15-18.
INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS.—Annual Convention, Atlantic City, N. J. Secretary, C. W. Pyke, Electrical Bureau, Philadelphia, Pa.

Sept. 19-20.
CONFERENCE INTERNATIONALE A LYON.—L'Union Internationale des Villes and l'Union des Associations Internationales, Lyons, France.

Sept. 21-25.
ILLUMINATING ENGINEERING SOCIETY.—Eighth Annual Convention, Cleveland, Ohio. Assistant Secretary, Joseph Langan, 29 West 39th street, New York City.

Oct. 6-9.
AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Boston, Mass. Secretary, Charles Carroll Brown, Indianapolis, Ind.

Oct. 7-9.
MOTOR TRUCK CLUB OF AMERICA.—Annual Convention, Detroit, Mich. President, George H. Duck, New York.

Oct. 20-23.
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Grunewald Hotel, New Orleans, La. Secretary, Mr. McFall, Roanoke, Va.

Oct. 21-23.
ALABAMA GOOD ROADS ASSOCIATION.—Nineteenth Annual Convention, Montgomery, Ala. Secretary, J. A. Rountree, 1021 Brown Marx Bldg., Birmingham, Ala.

Oct. 28-31.
NORTHWESTERN ROAD CONGRESS.—Annual Convention, Milwaukee, Wis. Secretary, J. P. Keenan, Milwaukee.

Nov. 9-13.
FOURTH AMERICAN ROAD CONGRESS.—American Highway Assoc. and American Automobile Assoc., Atlanta, Ga. Secretary, J. S. Pennybacker, Colorado Building, Washington, D. C.

Nov. 18-20.
WASHINGTON STATE GOOD ROADS ASSOCIATION.—Spokane, Wash. Secretary, M. D. Lechey, Alaska Building, Seattle, Wash.

Dec. 14-17.
AMERICAN ROAD BUILDERS' ASSOCIATION.—11th Annual Convention; 5th Annual Good Roads Congress, and 6th Annual Exhibition of Machinery and Materials, International Amphitheatre, Chicago, Ill. Secretary, E. L. Powers, 150 Nassau st., New York, N. Y.

Feb. 10-17, 1915.
EIGHTH CHICAGO CEMENT SHOW.—Coliseum, Chicago, Ill. Cement Products Exhibition Co., J. P. Beck, General Manager, 208 S. La Salle Street, Chicago, Ill.

Central States Water Works Association.

The Eighteenth Annual Convention of the Central States Water Works Association will be held in the Wind-

sor Hotel, Wheeling, W. Va., August 25th, 26th and 27th, 1914. An interesting program has been arranged and present indications point to the largest attendance in the history of the association.

The officers are: President, J. C. Martin, Wilmington, Ohio; vice-president, F. W. Collins, Mannistee, Mich.; secretary, R. P. Bricker, Shelby, Ohio, and treasurer, A. W. Inman, Massillon, Ohio.

Texas Good Roads Association.

The association met at Galveston August 17 for three days.

August 17—Meeting called to order at 10 a. m. by John W. Warren, president, San Antonio. Address of welcome, Hon. Lewis Fisher, Mayor-president, Galveston. Response, W. G. Turner, Fort Worth. President's address, John W. Warren.

2 p. m.—Convention called to order by the president. "Good Roads from an Economic Standpoint," George D. Marshall, Bureau of Good Roads, Department of Agriculture, Washington, D. C. 2:30 p. m., "Good Roads School of Instruction," conducted by Prof. R. J. Potts, consulting engineer, Texas Good Roads Association. 4:30 p. m., adjournment.

August 18—10 a. m., meeting called to order by the president. Completion of roll call by counties. Reports limited to five minutes. 10:30 a. m., "The Need of Good Roads Everywhere," Hon. Jesse Taylor, Jamestown, Ohio, National organizer, National Highway Association. 11:30 a. m., "The Need of Improved Highways from a Woman's Standpoint," Mrs. March Culmore, Houston, representative of the Texas Federation of Women's Clubs. Luncheon.

1:45 p. m.—Meeting called to order by the president. 2 p. m., "The Automobile vs. the Wagon," S. H. Boren, president Dallas Automobile Association. 2:30 p. m., school of instruction, conducted by Prof. R. J. Potts, consulting engineer, Texas Good Roads Association. 4:30 p. m., adjournment. 4:45 p. m., boat ride on Galveston harbor, as guests of Galveston Commercial Association.

Aug. 19—9:45 a. m., meeting called to order by the president. Address, "The Interest of Railways in Improved Highways," T. L. Peeler, industrial commissioner, Missouri, Kansas and Texas Railway Company. Address, "The Need of a State Highway Commission," Hon. H. B. Terrell, Waco. 11 a. m., address, "Why the Farmers Need Improved Roads," Hon. E. W. Kirkpatrick, president Texas Industrial Congress. Luncheon.

2 p. m.—Called to order by the president. "Working Convicts Upon the Public Roads in Texas," general discussion, led by R. G. Christian, highway engineer, Smith County. Business session.

County Commissioners of Pennsylvania.

The convention of the association was opened in Erie, on August 5th, by an address of welcome by Judge E. O. Walling. He emphasized the importance of the good road question and advocated a broad participation by the federal government in road building; he also spoke of the duties of county commissioners. J. I. Lee, of Blair County, and J. I. Reinsel, of Clarion County, responded to the welcome.

Addresses given at the various sessions were:

"The Legislation Creating Unnecessary Offices at the Expense of Taxpayers," A. C. Brown, solicitor Forest County; "A Codification of the Laws Governing the Duties, Rights and Privileges of County Commissioners," Isaac Winger, solicitor Franklin County; "Abolition of Directors of the Poor and Turning the Management and Control over to the County Commissioners," Thomas H. Hudson, solicitor Fayette County; "Legislation Imposing Liabilities of the State Upon the Counties Without Appropriations for Reimbursing Them," J. P. McNarney, solicitor Cameron County; "Roads as Viewed by a Citizen," David Jameson, Lawrence County; "Wanted—A More Efficient System of Assessment and Collection of Taxes," John Siggins, solicitor Warren County; "The Law Providing a Sealer of Weights and Measures in Rural Districts," R. A. Orbison, solicitor Huntingdon County; "The Expense of Views Conducted for the Benefit of Individuals, Corporations, Public or Private Municipalities Other Than Counties," W. N. Gilmore, solicitor Lycoming County; "Taxation of the Real Estate of Quasi-public Corporations for Local Purposes," Homer Greene, solicitor Wayne County; "Sales of Seated Lands for Non-payment of Taxes in 1914, by County Treasurers, Under the Act of May 21, 1913, P. L., 285," R. A. Mercur, solicitor Bradford County; "The Fees Allowed the Sheriff for Committing, Discharging and Transporting Prisoners," W. C. Byerly, clerk Jefferson County.

On Friday, the last day of the convention, discussions of important legal questions were given by each county.

Massachusetts Permanent Firemen's Association.

A one-day convention was held in Lynn, Mass., on August 12th. One of the features of the convention was the parade of Lynn's motor driven fire apparatus which called forth much favorable comment.

To urge the passage of the two-platoon bill, to fight against the contributory pension bill and to submit to the legislature a bill giving firemen dismissed from service the right to appeal from the decision of the lower court—these were some of the definite objects which the association set down for its accomplishment.

For the ensuing year these officers were elected:

President, Butler W. Steere, of Springfield; first vice-president, John

(Continued on page 245.)

NEW APPLIANCES

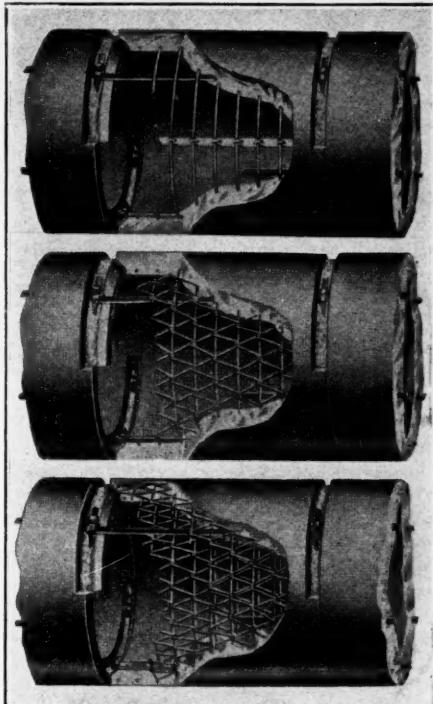
PORABLE AND READY-FOR-MOUNTING GAS ENGINES.

For Contractors' General Service, Specially Designed for Balanced, Smooth Operation.

The Foos Gas Engine may be obtained in either of two forms designed for portable service: the portable mounted on a steel truck and the "ready-for-mounting," designed to be mounted on skids or on the same truck as other machinery and differing from the portable only in that the gasoline tank is placed on the engine itself instead of under the seat as in the portable. Both types may be used for general contracting work such as hoist work, mixing, well-drilling, etc. The portable is wholly self-contained, having all parts except the gasoline tank built on the engine. The whole machine is so balanced that the truck requires no blocking or other bracing. The mounting is an all-steel truck with heavy channel beams securely braced. The axles are made of reinforced steel with wheels sufficiently heavy and well-proportioned. The engines are sold with full regular equipment and lever brakes in the larger sizes.

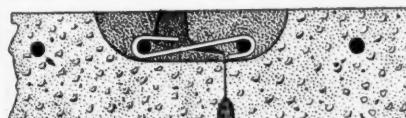
The portable service Foos engines are of the same general design as the regular Foos horizontal gasoline or the special Foos oil type engines and include all the characteristic advantages of the wipe spark self-cleaning igniter; positively operated opposed vertical valves; the inlet and exhaust valves in separate, adequately water-jacketed chambers; a governor with which speed changes may be quickly made while the engine is in operation; accessible oil cups; and the Foos centerline disc system of counterbalance. Every bearing can be oiled without stopping the engine. Large oil cups provide sight-feed lubrication on the most important bearings, including an oil cup for the crank pin, which can also be filled while running. It is claimed that the Foos portable has all the safeguards against overheating with the utmost convenience in operation.

The necessity for perfect counterbalance to obtain smoothness of operation is increased



REINFORCED CONCRETE PIPE.
Spiral, Mesh and Double Mesh.

when the engine is mounted on running gears. The durability of shaft and bearings necessitate that unequal thrust and angular variation be counterbalanced. In the Foos centerline counterbalance system is claimed a perfect method of balance and the proportion and inter-relation of recip-



CIRCULAR, LOCK JOINT AND ELLIPTICAL REINFORCING.

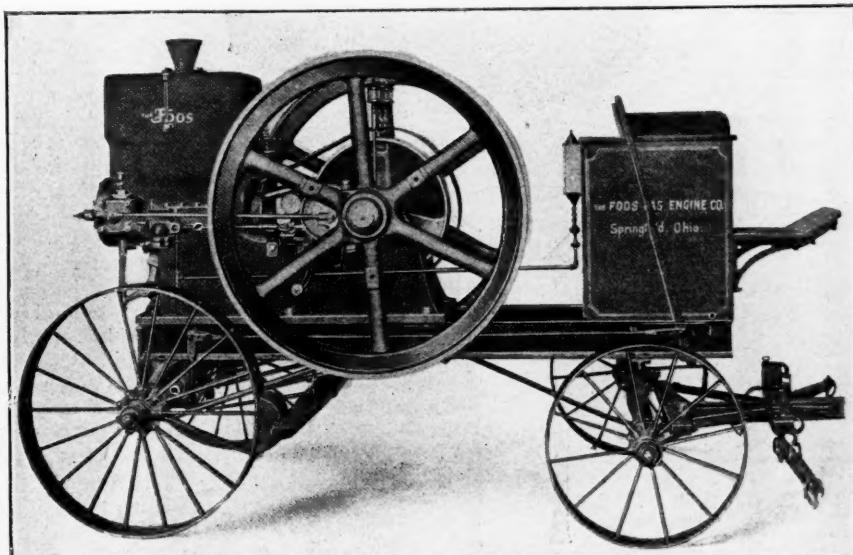
rocating and rotating parts completely worked out. In a test a Foos engine was placed on polished steel rollers and run at a speed 40 per cent. above normal rating. A photograph showed a smooth image indicating no vibration although the engine could be rolled along by hand.

The Foos engines, the portable type of which is shown in the illustration, are made by the Foos Gas Engine Company, Springfield, O.

REINFORCED CONCRETE PIPE.

Reinforced concrete pipe of various types conforming to strict specifications is made by the Reinforced Concrete Pipe Company, 332 Michigan Boulevard, Chicago, Ill. The forms used by the manufacturer consists of iron or steel, bottom and top rings and steel plates rolled to a true circle. The reinforcement of the pipe, as specified by the makers, is either open hearth or Bessemer process steel, uniform in all sections. In the standard pipe the circular reinforcement is either one layer placed elliptically in the shell with the major axis horizontal when the pipe is laid or of two layers concentric with and placed near the inner and outer surfaces of the pipe. There are three types of reinforcement: mesh, spiral and double mesh.

Special reinforced concrete pipe is made with an additional longitudinal reinforcement. In the pressure pipe, spiral reinforced, the spacing is not over four inches and the spirals are mechanically held at the proper spacing so that they cannot be displaced while the concrete is being placed in the forms. Sufficient steel is used to carry all tensile strains in the pipe, no allowance being made for any tensile strength in the concrete. Reinforced concrete pressure pipe is also made with special locks at the joint. The illustrations show the special reinforced concrete pipe of all three types with the longitudinal reinforcement and also cross-section diagrams of double and elliptical reinforcement and a section across joint and at lock outside of pipe. The pipes are 24 to 84 inches. $2\frac{1}{2}$ to 8 thick.



THE FOOS PORTABLE GAS ENGINE.

STORAGE BINS FOR CONCRETE AGGREGATES.

While many improvements have been made in the past few years, in concrete mixing and placing equipment, there is one very important department that has been neglected—the economical handling of the aggregates from cars to mixer. While it is true that on many large contracts suitable attention has been given to this part of the work, it is also true that no attention is paid to this feature on most of the medium or small contracts. There is apparently no legitimate reason for this condition, as it is just as important to have proper equipment for economically handling this department, as it is to have the right kind of mixer or other equipment. What is believed to offer practical method of handling and storing concrete aggregates is the Weller Unit-System Storage Bin. This bin is made up of interchangeable units,—supports, bin, and hopper bottoms—and may be treated exactly as any other part of a contractor's outfit and taken apart, moved, stored and erected as often as required. These bins are used to store sand, gravel, stone, bulk cement, etc., and are constructed either with or without roof. The claim is made that with these bins and suitable handling systems that the aggregate for one cubic yard of material in place may be unloaded from cars, put into storage until required and delivered to the mixer for ten cents per yard, including upkeep and overhead charges. These bins are made by the Weller Manufacturing Co., 853-865 North Avenue, Chicago, Ill.

SANITARY GARBAGE CAN. Lid Mechanism Operated by Foot— Equipped with Automatic Disinfecting Device.

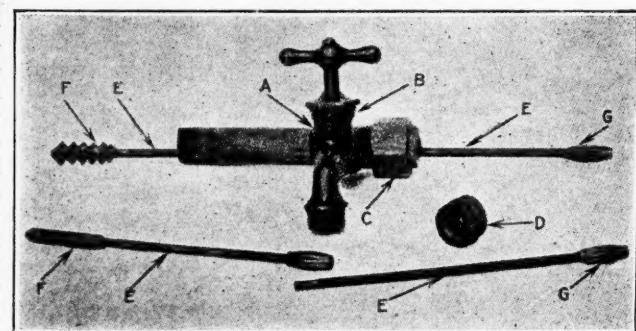
A garbage can which need not be touched by hand, which is almost impossible of being tipped over and which automatically disinfects the contents every time the lid is closed should certainly prove a valuable installation in any city which believes that sanitary garbage collection is better than suppressing epidemics. The "Superior" Sanitary Garbage Can cannot be removed unless the foot lever is operated so that no dog or other animal can upset it. In opening the

lid is raised and automatically swung out by the foot pressure on the lever and on removing the foot the lid swings back automatically and closes down. A sideways motion of the lever locks it and holds the cover open. Supported above the center of the lid by a hollow casting is a container to hold a quart of disinfecting liquid. The disinfectant flows down to the distributor which is located directly under the lid and sprays the fluid all over the contents of the can every time the lid is closed after using. The operating mechanism of the lid is very simple, consisting only of a lever or dog and a touch

on the pedal throws off a clutch. The can is set on a galvanized cast-iron base and is made of heavy sheet steel, heavily galvanized and reinforced at top and bottom by iron rims. The Superior

Can is made in two sizes—two and three bushel sizes—the latter being suited for public parks and streets.

Superior garbage cans are manufactured by the Superior Manufacturing Company, Magnolia Street, Pittsburgh, Pa.



STAPLES PIPE CLEANER.



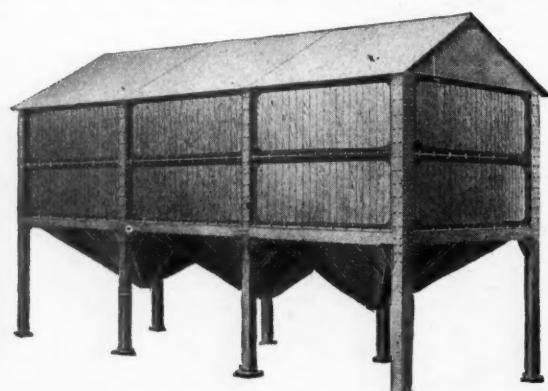
WATER AND GAS SERVICE PIPE CLEANER.

The Staples Service Pipe Cleaner is claimed to clean the inside of water and gas service pipes of any size or length. Rust and other obstructions may be removed without disturbing the pipe or incurring the consequent troubles and expenses. It is claimed that a hundred feet can be cleaned in less than one hour.

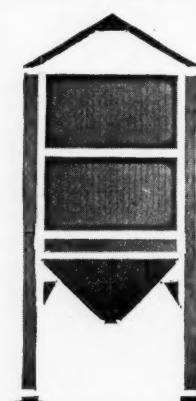
In the accompanying illustration: A is the cleaner; B, the faucet outlet for hose connection; C, the stuffing box; D, the stuffing box diaphragm rubber washer; E, a joined rod; F, the cutter, and G, couplings for the rod. In using the Staples Cleaner the water is shut off at the cellar wall. The cutter is put in the cleaner, the cleaner is screwed in stop and waste cock in cellar. The water is turned on and the faucet B opened; E is pushed back and forth, always turning to the right. Another section of rod and coupling is then added until the entire length of pipe is cleaned. The water is always left running at the faucet so as to carry off the dirt-laden water and facilitate the cleaning. The Staples Service Pipe is made by G. T. Staples, Dedham, Mass. It is in successful use by many water departments, among these being Charleston Light and Water Co., S. C., Portland Water District, Maine, Cambridge, Holyoke, Lowell, Middleboro and Westfield, Mass., Milford, N. H., and Watertown, N. Y.



SUPERIOR SANITARY GARBAGE CAN.



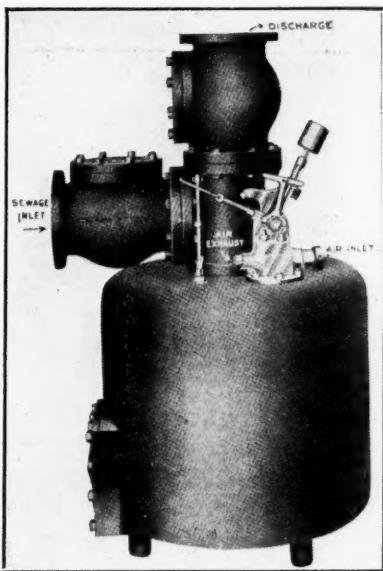
WELLER STORAGE BINS SHOWING UNIT CONSTRUCTION.



AN AUTOMATIC PNEUMATIC SEWAGE EJECTOR.

The Simplex Ejector is an automatic pneumatic sewage ejector made for handling comparatively small quantities of sewage or any liquid carrying solid matter. It is well suited for

lifting the sewage, say of one street which is below sewer level. One of these ejectors, for instance, is in use for handling sand and water in the place of a centrifugal pump. The ejector is operated by compressed air which enters the inlet as shown and moves back and forth the hammer top which controls the valves. The sewage is drawn and forced out alternately from the two sides of the chamber. The chief feature claimed for this ejector is its simplicity and its consequent absolutely positive and automatic action. All parts are of easy access and are interchangeable and may be



SIMPLEX SEWAGE EJECTOR.

renewed without disturbing the pipe connections. The amount of excavating required for this is claimed to be only half of that required for any other ejector. The ejector is noiseless in operation and as the action is instantaneous only a minimum of compressed air is used—making operation also economical. The valves and all working parts are entirely of bronze and the inlet and discharge openings of ample capacity. The ejector works without annoying backing up of drains.

This ejector is made by the Simplex Ejector Company, 1115 Washington Boulevard, Chicago, Ill.

JOINT RUNNERS.

Vanderman's Asbestos Lead Joint Runner is the name of a patented joint runner adapted for soil, water or gas pipes or any kind of bell pipe where the joint is poured of molten lead. It is claimed of this runner that it is easy to handle and apply and that the hot lead cannot affect it. The runner is ferruled at the ends and the clamp is either of the spring type for pipes from 2 to 14 inch size or the wing-bolt screw clamp for pipe from 8 to 48-inch size. Improvements, shown in the illustrations, are the one-piece clamps which have no adjustable parts, the runner being held by compression. Another improved type is the square joint runner which has a metal dam for better holding the joint metal. This

is made for pipe 3 to 72 inches in diameter. These joint runners are included in a line of supplies made by the Vanderman Mfg. Co., Willimantic, Connecticut.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago.—Only inquiry of importance was for 500 tons at St. Paul. Quotations: 4 inch, \$26; 6 to 12 inch, \$24; 16 inch and up, \$23.50. New York—Bids opened at Atlantic City, N. J., on 285 tons of 12 inch. Quotations: 6 inch, \$20.50 to \$21.

Lead.—New York—\$3.85. St. Louis—\$3.675.

The Continental Public Works Company, W. B. Spencer, president, 2 Rector Street, New York City, has just placed its order with The F. D. Cummer & Son Co., Cleveland, O, for a Cummer road asphalt mixing plant. This company has been operating one of these Cummer road plants all of this season on the roads around the Ashokan reservoir, near New York City, turning out bituminous concrete. It has averaged better than 1,000 square yards of 2 in. bituminous concrete per day. The second Cummer road plant, just ordered, is to be shipped immediately, and it will be used for the time being on the above work.

James B. Clow and Sons, Harrison Street, Chicago, Ill., have just issued a new catalog which contains some valuable information on their products—particularly cast iron pipe. Cast iron threaded and flanged pipe and fittings, Clow coir fibre cast iron well screens and all types of valves are featured.

E. D. Etynyre & Co., Oregon, Ill., recently delivered to the city of Fort Wayne, Ind., a motor-propelled street flusher. The new machine was given a severe test and Mayor Hosey was well pleased with its performance.

The Life Saving Devices Co., 1330 Chamber of Commerce Bldg., Chicago, Ill., has delivered a lungmotor to the fire department of White Plains, N. Y.

The Terry Steam Turbine Co., Hartford, Conn., announces the appointment of Fidangue Bros. & Sons of 15 Whitehall street, New York City and Panama, as representatives in the latter and the Canal Zone. The Cleveland office of the Terry Co. has moved from 710 New England Building to 503 Union Building.

The Zeidler Concrete Pipe Co., Muscatine, Iowa, has been incorporated for the purpose of producing concrete, cement, clay and stone products including tile, pipe and brick. The directors are John L. Zeidler, W. Jayne and F. Hoffman and the capital stock \$40,000.

News of the Societies

(Continued from page 242).

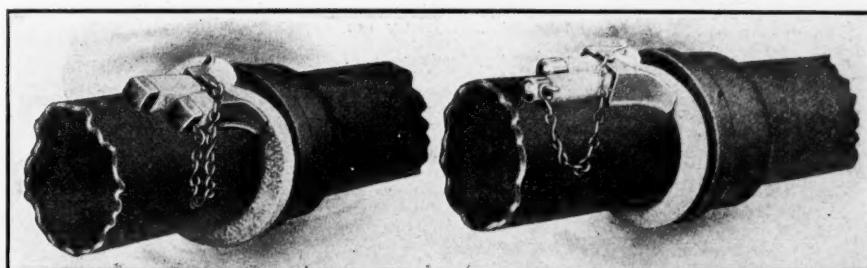
A. Coneeny of Somerville; second vice-president, Thomas S. Pope of Salem; third vice-president, D. J. Haggerty of Chicopee; secretary, Thomas J. Powers of Worcester; treasurer, Ernest A. Slattery of Fitchburg; board of directors, E. J. Barry of Brockton, J. J. Crowley of Holyoke, John J. Kelley of Lawrence, Lieut. Robert Ferguson of Lynn, Alden W. Keddie of Malden, Thomas Burke of Fall River, John A. Hawkins of Haverhill, E. J. Stacey of Newton and Harry J. McNealey of Boston; sergeant at arms, Daniel Hanan of Peabody.

National Paving Brick Manufacturers' Association.

Part of the program in general has been given out by Will P. Blair, secretary of this association.

An attempt by this association at the annual meeting in Cleveland last year in the study of brick street construction was undertaken. The results were of value not only to the manufacturers and engineers, but especially so to the public. At any rate a further study is well worth while, so there will be undertaken in connection with the annual meeting at Buffalo, New York, on September 9, 10 and 11, a "Study of Brick Pavement Construction for Country Highways," and in addition to this the importance of such roads to the city and urban population is to be studied by observation and inspection in the open. September 9 will be utilized by the members for their business meeting. A discussion over specification questions will be held on the evening of the 9th, with the brick committee of the American Society of Municipal Improvements. The itinerary and program on the 10th will include a trip through the city and out into the country over the older as well as the newer highways, observing those under construction. The noon luncheon will be served at Roycroft Inn. On the return guests and friends will assemble for an evening dinner at the Statler Hotel.

On September 11 a trip will be taken over the Niagara Boulevard to Fort Niagara.



ONE-PIECE CLAMP JOINT RUNNERS.

ADVANCE CONTRACT NEWS

**ADVANCED INFORMATION
BIDS ASKED FOR**
**CONTRACTS AWARDED
ITEMIZED PRICES**

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Wash., North Yakima	2 p.m., Aug. 22.	Macadamizing two miles.....		W. B. Newcombe, Co. Aud.
Mo., Festus	8 p.m., Aug. 22.	Street improvements		J. C. Davison, City Clk.
O., Marion	Noon, Aug. 22.	Resurfacing		V. P. Garfield, Clk. Marion Co. Bd. Comrs.
O., Findlay	1 p.m., Aug. 22.	Two stone roads.....		Jean G. Copeland, Clk.
N. D., Harvey	2 p.m., Aug. 22.	Grading		P. J. Egeland, Clk. Twp. Bd. Town Board
Ind., Milton	Aug. 22.	Cement crossings		Fred Feuchter, Vil. Clerk
Ohio, West Park	Aug. 22.	Improving streets		D. F. Dawson, Clk. New Haven Township.
O., Chicago Junction	Noon, Aug. 22.	Road improvements		G. L. McKibben, Con. Engr.
O., Van Wert	Noon, Aug. 22.	Draining, curbing and paving.....		J. E. Williams, Clk. Vil. Council.
O., New Athens	Noon, Aug. 24.	Six-inch crushed limestone paving.....		
N. D., Williston	10 a.m., Aug. 24.	Road grades and bridge approaches in several townships.....	County Commissioners.	M. H. Aaxen, Co. Aud.
N. D., Williston	10 a.m., Aug. 24.	Road grading and bridge approaches.....		J. H. Dean, Co. Clk.
Neb., Kearny	Noon, Aug. 24.	County road construction		
Ky., Louisville	2 p.m., Aug. 24.	Vitrified block gutters and asphalt pavement; also bituminous concrete pavement and granite tube pavement.....	R. G. McGrath, Sec. B. P. W.	
Ind., Milford	2 p.m., Aug. 24.	Pav. sts. with brick, including conc. curb & gutter.....	A. J. Forbing, Town Clerk	
Mo., Kansas City	Aug. 24.	Grading, draining and culverts.....	Co. Clerk.	Wilson R. Ellis, Secy. State High. Comm.
Cal., Sacramento	Aug. 24.	Road improvements		Harry A. Stewart, Clk.
N. J., Hackensack	2 p.m., Aug. 24.	Road improvements		Calvin H. Brown, Aud.
Ind., Fort Wayne	10 a.m., Aug. 24.	Concrete road improvement, 5,000 ft.		Allan Osborne, Engr., Charlotte
N. C., Mooresville	Aug. 24.	9,000 yds. bituminous paving, concrete base and curb.....		J. P. Gaffney, City Engr.
Md., Cumberland	Aug. 24.	Paving 33 streets.....		County Auditor.
Minn., Watseka	2 p.m., Aug. 24.	Grading in county.....		T. L. Palmer, Clerk.
Minn., Duluth	10 a.m., Aug. 24.	Grading and paving one street.....		J. F. Hohensee, City Clerk.
Wis., Fond du Lac	3 p.m., Aug. 24.	Furnishing material and constructing walk.....	C. A. Robey, City Engr.	
Ia., Waterloo	Aug. 24.	15,000 sq. yds. asphaltic concrete pavement.....	J. L. Bauer, Co. Engr.	
N. J., Elizabeth	3:30 p.m., Aug. 24.	Macadam roadways and guttering.....	W. A. Wheeler, Clk. Co. Comrs.	
Md., Bellaire	Noon, Aug. 24.	Constructing three miles of road.....	Harrison & Butts, Boro. Engrs.	
Pa., Wilkes-Barre	Noon, Aug. 24.	Amesite paving.....	A. R. Callow, Comr. P. & Sup. City Engineer.	
O., Cleveland	Noon, Aug. 24.	Stairway in park.....	E. C. Ginger, Co. Engr.	
Tex., San Antonio	4 p.m., Aug. 24.	Surfacing with any material.....	Boro. Engr., City Bldg., Farrell, Pa.	
O., Steubenville	Noon, Aug. 25.	Half mile brick		
Pa., Wheatland	noon, Aug. 25.	Grading		
Ind., Fort Wayne	Aug. 25.	17 paving contracts; brick, asphalt and concrete being considered	City Clerk.	
Wis., Green Bay	10 a.m., Aug. 25.	Constructing combined concrete curb and gutter.....	City Clerk.	
Neb., Auburn	Noon, Aug. 25.	\$3,385 road improvements.....	Frank E. Black, City Clk.	
Ind., South Bend	10 a.m., Aug. 25.	Paving	Board Public Works.	
O., Smithfield	Aug. 25.	Half mile brick road.....	Co. Aud., Steubenville.	
D. C., Washington	Aug. 25.	Cement paving, conduits & manholes.....	B. Sweeney, Asst. Secy. Dept. Interior	
Cal., Sacramento	2 p.m., Aug. 25.	6½ miles of asphalt on conc. & 23 miles of conc. road.....	State Hig. Comm	
Tex., San Antonio	Aug. 25.	Paving 43 streets, estimated cost \$250,000.....	H. Halland, City Engineer	
Minn., Anoka	2 p.m., Aug. 25.	County roads	A. A. Caswell, Co. Aud.	
Md., Hagerstown	Aug. 25.	Constructing macadam roads and concrete bridge.....	B. M. Hartle, Clk.	
Minn., Anoka	2 p.m., Aug. 25.	Surfacing one road	A. A. Caswell, Co. Aud.	
Pa., Hanover	6 p.m., Aug. 26.	Grading, paving, curbing, etc.....	F. C. Rowe, Sec. Bd. Comrs., Wilkes-Barre, P. O.	
Ind., Fort Wayne	Aug. 26.	Surfacing several streets with concrete.....	Board Public Works.	
Mo., Festus	8 p.m., Aug. 26.	Grading, curbing and paving.....	C. J. Davidson, City Clk.	
Neb., Lake City	8 p.m., Aug. 26.	Combined curb and gutter, also stone inlets.....	J. M. Fickle, City Clerk.	
Pa., Union City	8 p.m., Aug. 26.	Grading, curbing and paving with brick.....	T. H. Reynolds, Boro. Engr.	
Pa., Meadville	8 p.m., Aug. 26.	Grading, curbing and brick paving.....	T. H. Reynolds, Boro. Engr.	
Cal., Santa Maria	Aug. 27.	Grading and paving	Bd. Supvrs., Santa Barbara.	
Minn., Hanska	Aug. 27.	Grading, 3,650 ft.	Town Clerk of Lake Hanska.	
Ind., Ft. Wayne	Noon, Aug. 27.	9 sidewalks and 4 alley paving jobs.....	Board of Works	
Va., Roanoke	Noon, Aug. 27.	Granolithic sidewalk and granite curb.....	M. D. Moss, Asst. City Clk.	
W. Va., Wheeling	Aug. 27.	Six miles of road with brick or bituminous.....	Geo. Stenrod, Co. Engr.	
W. Va., Wheeling	9:30 a.m., Aug. 27.	Resurfacing with brick, bitulithic or bituminous surface.....	G. W. Oldham, Clk.	
Minn., Benson	1 p.m., Aug. 28.	5,308 ft. turnpike and graded road.....	D. P. Carney, Co. Aud.	
O., Circleville	Noon, Aug. 28.	3,864 sq. ft. cement sidewalks.....	H. A. Alkire, City Engr.	
O., Lima	Aug. 29.	Grading	A. R. Bryson, Engr.	
Ind., Goshen	2 p.m., Aug. 29.	Grading, paving and improving road.....	A. W. Brown, Auditor.	
Cal., Sacramento	Aug. 31.	Highway construction in several counties.....	A. B. Fletcher, State Hwy. Engr.	
O., Canal Dover	Aug. 31.	Paving	Dir. Pub. Service.	
N. Y., Little Falls	Aug. 31.	Bitulithic	Ed. Pub. Works.	
Minn., Minneapolis	11 a.m., Aug. 31.	Concrete paving in West Minneapolis.....	G. A. P. Erickson, Co. Aud.	
Ind., Wausau	10 a.m., Aug. 31.	Gravel road	V. D. Mock, Aud.	
Ind., Newport	10 a.m., Aug. 31.	Gravel road	Roy Slater, Co. Aud.	
Ind., South Bend	11 a.m., Aug. 31.	13,200 ft. gravel road	Clarence Sedgwick, Aud. St. Joseph Co.	
Cal., Sacramento	11 a.m., Aug. 31.	Road construction	G. S. Brown, Engr.	
W. Va., Charleston	Sept. 1.	Paving and grading. \$32,500.....	St. Hwy. Engr., Salem, Ore.	
Ore., Hood River	Sept. 1.	\$75,000 state roads.....		
Pa., Harrisburg	Sept. 1.	Brick block paving, asphaltic bituminous macadam, asphaltic concrete and one pavement with either Amesite, Warrentine, Filbertine, Unionite, concrete, brick, block or bituminous asphalt.....	State Highway Dept.	
Tenn., Wartburg	Sept. 1.	.80 miles of pike.....	C. A. Quinn, Secy. Park Road Comm., Lancing, Tenn.	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ohio, Wellsville		Sept. 1.	500 ft. brick or block.....	J. F. McQueen, City Aud.
Pa., Harrisburg		10 a.m., Sept.	Brick, asphaltic concrete and asphaltic bituminous macadam pavement in several townships.....	E. W. Bigelow, St. Hwy. Comr.
Minn., Park Rapids		2 p.m., Sept.	Surfacing, grubbing, culverts; cost, about \$6,300.....	C. E. Spencer, Dist. Engr.
N. Y., Albany		1 p.m., Sept.	Highway improvements in various counties.....	J. M. Carlisle, St. Hwy. Comr.
Minn., Wilmar		10 a.m., Sept.	State roads in several townships.....	Bd. Comrs.
O., Cleveland		10 a.m., Sept.	Improving one road	Co. Comrs.
O., Cleveland		Sept.	Road improvements	W. A. Stinchcomb, Co. Clk.
Ind., Indianapolis		10 a.m., Sept.	Improving streets.....	Board of Pub. Works
S. D., Ralph City		Sept.	Grading one road	County Auditor.
N. J., Paterson		2 p.m., Sept.	Improving two streets with asphalt and granite.....	F. G. Sloan, Chm. Road Com.
Ohio, McConnellsburg		noon, Sept.	Grading and brick paving and curbing.....	C. C. Morgan, Vil. Clerk
Idaho, Pocatello		8 p.m., Sept.	Paving in three districts.....	W. H. Jackson, City Clk.
Ind., Columbia City		Noon, Sept.	Grading, paving and improving road	C. E. Kiser, Co. Aud.
Wis., Racine		10 a.m., Sept.	Grading several streets	Board Pub. Wks.
Ohio, Cincinnati		noon, Sept.	Road improvements.....	Fred. E. Wesselman, Pres. Ham. Co. Comrs.
Ohio, Oak Harbor		Sept. 4.	Paving	L. N. Carstensen, Vil. Clk.
N. Y., Brooklyn		Sept. 5.	Wood block and granite block.....	Eur. Yards & Docks, Navy Dept., Washington, D. C.
Ind., Vernon		11 a.m., Sept.	Road construction.....	B. J. Bernhardt, Jennings Co. Aud.
Fla., Madison		10 a.m., Sept.	1,500 sq. ft. of walks, 1,900 lin. ft. coping, 900 ft. curb-stone, all cement.....	Bishop & Greer, Archs., Valdosta, Ga.
Ind., Rensselaer		2 p.m., Sept.	Grading and paving.....	Jos. P. Hammond, Jasper Co. Aud.
Ind., Shoals		1 p.m., Sept.	Grading, draining and paving with limestone and gravel.....	L. D. Haga, Co. Aud.
Ind., Greensburg		1 p.m., Sept.	Grading, paving and improving road	County Auditor.
Ind., Tipton		10 a.m., Sept.	Grading, paving and improving road	J. H. Tranbarre, Co. Aud.
Ind., Lebanon		1 p.m., Sept.	Grading, paving and improving road	J. M. Clarke, Co. Aud.
Ind., Fowler		1 p.m., Sept.	Grading, paving and improving road	W. Mankey, Co. Aud.
Utah, Ogden		10 a.m., Sept.	Constructing concrete curbs and gutters and grading.....	F. O. Stanford, City Recorder.
Ind., Brazil		10.30 a.m., Sept.	Grading, paving and improving road	E. A. Staggs, Co. Aud.
Ind., Knox		Noon, Sept.	Grading, paving and improving road	T. W. Weninger, Co. Aud.
Ind., Danville		10 a.m., Sept.	Road construction	Township Comrs.
Fla., Arcadia		2 p.m., Sept.	Improving roads and bridges, \$350,000.....	A. L. Durrance, Clk. Court.
Ind., South Bend		11 a.m., Sept.	10,150 ft. gravel road & 63,470 ft. concrete road.....	Clarence Sedgwick, St. Joseph, County Auditor
Ind., Richmond		Sept. 12.	Construction of gravel roads.....	Louis Bowman, Aud.
Ind., Auburn		10 a.m., Sept.	Grading, draining and graveling.....	A. W. Madden, Co. Auditor.
W. Va., Kanawaha Co.		Sept. 15.	Improving five miles roads	F. A. Duodett, Engr.

SEWERAGE

Ind., New Castle	10 a.m., Aug.	22.	Ingot iron sewer	P. H. Wofford, Henry Co.; A. Geo. H. Morrison, Comr.
Ind., Kokomo	10 a.m., Aug.	22.	Ditch construction	Bd. Loc. Imps.
Ill., Galva	4 p.m., Aug.	22.	Sanitary sewer	F. D. Whip, Fiscal Supv., Springfield.
Ill., Anna	3 p.m., Aug.	24.	Sewage settling tank for hospital.....	Dir. Pub. Serv.
O., Zanesville	Noon, Aug.	24.	Storm and sanitary sewers.....	Board of Public Works.
Mich., Bay City	8 a.m., Aug.	24.	Constructing a reinforced concrete socket tile sewer.....	P. A. Edquist, Engr., Omaha.
Neb., Benson	8 p.m., Aug.	24.	Main sewer and disposal plant.....	W. F. Andrews, City Clerk.
Minn., Ada	8 p.m., Aug.	25.	1,416 feet sewer	Dept. Public Works.
Ind., South Bend	10 a.m., Aug.	25.	Pipe sewer	W. F. Savage, Recorder.
Ore., Enterprise		Aug. 25.	Construction of sewer	Lund & Hill, Little Rock
Ark., Argenta	10 a.m., Aug.	25.	17 miles of tile sewer & 3 miles of reinforced concrete sewer to cost about \$300,000.....	R. F. Johnson, Comr. Light, Water, etc.
Mich., Saginaw	7.30 p.m., Aug.	25.	Constructing pipe sewers	C. A. Batman, Co. Aud.
O., Cincinnati	Noon, Aug.	25.	400 ft. sewer	City Engr.
Ia., Nevada	1.30 p.m., Aug.	25.	Drains in India Creek Township.....	H. E. Shire, Sec. Reformatory Com., 1010 Hartmand Bldg., Columbus.
Conn., Hartford	11 a.m., Aug.	25.	Sewer system	Dept. Public Works.
O., Marysville	2 p.m., Aug.	26.	Sanitary sewer	H. E. Persons, City Clerk.
Pa., Philadelphia	Noon, Aug.	26.	10 miles of sewer	M. S. Miller, City Clerk
Minn., Marshall	7.30 p.m.	Aug.	Extending sewers	Council.
Ind., Greencastle	7:30 p.m., Aug.	26.	9.5 miles pipe sewer 8 to 18 inches.....	H. G. Vollmer, City Engr.
Minn., Warroad	8 p.m., Aug.	27.	Constructing sewers	M. J. Magin, Clerk.
Ia., Burlington	9 a.m., Aug.	27.	Constructing vit. pipe sewer, also grading and curbing.....	W. F. Pilcher, St. Arct., Albany
N. Y., Rochester	2 p.m., Aug.	28.	Vitrified pipe sewer	C. E. Byrket, Drainage Comr.
N. Y., Bedford Hills	2 p.m., Aug.	28.	Extending sewerage and sewage disposal plant.....	Iowa, Council Bluffs. 5 p.m., Aug. 31. Manholes, e. 5,650 ft. 6-in., 5,820 ft. 8-in., 4,780 ft. 10-in., 1,605 ft. 12-in. sewer..... Chas. J. Duff, City Clerk
Ind., New Castle	1.30 p.m., Aug.	29.	Drain	J. F. McQueen, Co. Aud.
Ore., San Antonio	4 p.m., Sept.	7.	15,000 ft. 72-inch sanitary sewers.....	D. C. Brown, Secy. Trust.
Ark., Argenta	Sept.	10.	17 miles tile sewer and 3 miles reinforced concrete sewer.....	M. Bloomberg, Dir. P. Serv.
Ia., Forest City	Sept.	22.	Constructing ditches and tile laterals.....	Jos. F. Lenny, City Clerk.
La., New Orleans	Noon, Oct.	2.	Extensions to drainage system.....	E. C. Brenner, Clerk.
				Fred'k Fries, City Clk.
				Lund & Hill, Engrs., Little Rock, Ark.
				C. P. Nelson, Co. Aud.
				F. S. Shields, Secy. Sewerage & Water Bd.

WATER SUPPLY.

Tex., George West	Aug. 24.	Waterworks sewer system and light plant.....	Bartlett & Rainey, Consrlt. Engrs., San Antonio
N. J., Belleville	9 p.m., Aug.	25.	Laying c. i. pipe.....
N. J., Woodbury	7.30 p.m., Aug.	25.	Pumping station and main for artesian well system.....
Ind., Lockport	10 a.m., Aug.	25.	Well construction
N. Y., Riverhead	1:30 p.m., Aug.	25.	Water system.....
Minn., St. Paul	10 a.m., Aug.	25.	Cast-iron special castings
Ill., Lake City	Aug.	26.	4-in. water pipe.....
Minn., Marshall	7.30 p.m., Aug.	26.	2,950 ft. of 4-inch water main, tees, elbows, valves, hydrants, etc.
O., Marysville	2 p.m., Aug.	26.	Well house, wells, water softening plant, boiler feed pump, etc., at Ohio Reformatory for Women.....
Neb., Dalton	Aug. 27.	2.	Constructing water works. cost \$7,200.....
Mich., Highland Park	10 a.m., Aug.	29.	Steel intake crib, 36-in. main and concrete well.....
O., Continental	Noon, Aug.	29.	Extending water works
Me., West Pownal	Noon, Sept.	1.	Concrete dam, filter, pumping station, pumps, water main, etc., for state school for feeble minded.....
S. D., Parker	10 a.m., Sept.	4.	Making addition to water works system.....
Tex., Denison	Noon, Sept.	5.	2,000,000-gallon filter plant

Arthur B. Fels, Engr., 50 Union St., Portland
C. I. Jones, City Auditor.
A. B. Clemmy, City Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. D.	Wahpeton	8 p.m., Sept.	8.. Mechanical gravity filter plant; capacity 1,000,000 gallons.	L. H. Wolfe, Con. Engr.
Wash.	Puget Sound	10 a.m., Sept.	8.. Supplying wrought-iron pipe, cast-iron elbows, valves, water meters, etc.....	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
Cal.	Mare Island	10 a.m., Sept.	8.. Cast-iron pipe, valve, etc.....	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
Man.	Winnipeg	Sept 19	.84 miles of aqueduct, \$8,729,000.....	Greater Winnipeg Water Dist.
Miss.	Vicksburg	5 p.m., Sept.	21.. Water works system and filters.....	A. M. Taxton, City Clk.

LIGHTING AND POWER.

Tex., George West	Aug. 24	Electric light plant and water works system to cost \$24,000	Bartlett & Raney, San Antonio.
Tex., Houston	10 a.m., Aug.	24.. Poles and wires.....	L. H. Washburn, Co. Aud.
Cal., Los Angeles	2 p.m., Aug.	24.. Lighting system, electric.....	Co. Supervisors.
Mass., Boston	10 a.m., Aug.	25.. Acetylene tanks	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
N. J., Woodbury	7.30 p.m., Aug.	25.. Low service pumping machinery, including two 3,000,000 gal. units, and high service pumping machinery, one 3,000,000 gal. unit and 16-inch pumping main.....	A. Starr, City Recorder.
S. D., Parker	Aug. 25	.. Electric light and power plant.....	Oscar Claussen, Engr. Co., Commercial Bldg., St. Paul, Minn.
D. C., Washington	Aug. 25	.. Centrifugal air compressor set.....	Bureau of Supplies & Accts., Navy Dept.
Minn., West Brook	8 p.m., Aug.	25.. Electric light system.....	E. G. Huebert.
N. J., Newark	4 p.m., Aug.	26.. Installing new boiler and apparatus.....	Committee Pub. Bldgs.
D. C., Washington	Aug. 26	.. Furnishing phosphor wire, steel boiler tubes, duplex wire, lamp cord, steel conduit, etc.....	Bureau Sup. & Accounts.
Ill., Banner	Aug. 26	.. Electrically driven drainage pumping plant.....	Drainage Comrs.
Sask., Moose Jaw	Aug. 26	.. High pressure pipe and appliances for 3,500 H.P. plant.....	City Comrs.
Pa., Philadelphia	Aug. 29	.. Two 500-K.W. rotary converter sets.....	Bur. Yds. Docks, Navy Dept., Wash., D. C.
S. D., Parker	10 a.m., Sept.	4.. Constructing new electric light plant.....	C. L. Jones, City Auditor.
Conn., Hartford	11 a.m., Sept.	8.. Ornamental street lighting.....	Supt. Streets.
Mich., Holland	Sept.	9.. Lighting fixtures, approaches, etc., for post office.....	Treas. Dept., Wash., D. C.
H. T., Pearl Harbor	10 a.m., Sept.	15.. Electrical supplies	S. McGown, Paym. Genl., U. S. N., Wash., D. C.

FIRE EQUIPMENT.

N. J., Asbury Park	Aug. 24	.. Equipment for ladder truck.....	S. H. Calvert, Vil. Clk.
N. H., Portsmouth	10 a.m., Aug.	25.. Furnishing navy yard hose.....	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
S. C., Charleston	10 a.m., Aug.	25.. Furnishing hose	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
Va., Norfolk	10 a.m., Aug.	25.. Furnishing hose	S. McGown, Paym. Genl., U. S. N., Wash., D. C.
O., Tiffin	Noon, Aug.	27.. One triple combination chemical hose wagon and pumping engine gasoline driven, one city service ladder truck gasoline driven without equipment, one fire chief's roadster	A. H. Hafley, Clk.
Ill., Chicago	11 a.m., Aug.	31.. Automatic sprinkler, hydrant and standpipe system.....	E. C. Shankland, Chmn. Harbor and Subway Comm.
O., Marion	Noon, Sept.	2.. Two motor fire engines.....	L. P. Smart, Dir. Pub. Safety.

BRIDGES.

O., Wapakoneta	Aug. 22	.. Making repairs to several bridges.....	J. H. Meyer, Co. Surv.
Mo., Chillicothe	Aug. 22	.. Seven reinforced concrete bridges.....	J. Broaddus, Bridge Comr.
Okla., McAlester	Aug. 24	.. Reinforced concrete bridge.....	J. M. Ganaway, City Clerk.
N. J., New Brunswick	Aug. 24	.. Concrete slab bridge.....	A. B. Fox, Co. Engr., Perth Amboy
Kan., Erie	Aug. 24	.. Constructing four bridges	County Commissioners.
Mo., Kansas City	Aug. 24	.. Constructing two concrete bridges.....	County Surveyor.
Wash., Ritzville	Aug. 24	.. Three reinforced concrete bridges.....	F. R. Huett, Adams Co. Engr.
Pa., Norristown	11 a.m., Aug.	24.. Several bridges	John J. Jacobs, Montgomery Co. Comptroller
N. Y., New Hartford	2 p.m., Aug.	24.. Steel and concrete bridge	Chas. O. Padley, Town Clk.
Kan., Erie	Noon, Aug.	24.. Four bridges	W. E. Neal, Clk.
Ariz., Phoenix	2 p.m., Aug.	24.. Bridge construction	U. S. Reclamation Service.
N. J., Perth Amboy	2.30 p.m., Aug.	24.. Concrete slab bridge	Ed. of Chosen Freeholders.
Pa., Butler	Noon, Aug.	25.. Viaduct	H. O. Carson, City Engr.
Pa., Williamsport	Noon, Aug.	25.. Several bridges	A. P. Zuber, Lycoming Co. Clk.
Ind., Muncie	Aug. 25	.. Two steel bridges	F. M. Williams, Aud.
N. Y., Albany	Noon, Aug.	25.. Superstructure and approaches of Vischer's Ferry Road, to cost \$45,885 and raising highway bridge at Mechanicville, to cost \$8,314.....	D. W. Peck, Supt. Pub. Wks.
Ind., Indianapolis	10 a.m., Aug.	25.. Bridge	W. T. Patten, Marion Co. Aud.
Md., Baltimore	Noon, Aug.	25.. Concrete arch bridge	O. E. Weller, Chm. St. Rds. Comsn.
Ill., Macoon	9 a.m., Aug.	25.. Reinforced concrete bridge and culvert	J. E. Vail, Co. Supt. Hwys.
Tenn., Chattanooga	11 a.m., Aug.	25.. Concrete culvert	County Engineer.
Alt., Calgary	..	26.. Four arch span reinforced concrete bridge	City Engineer.
Md., Baltimore	2 p.m., Aug.	27.. Reinforced concrete bridge	O. E. Weller, Chm. State Rds. Comm.
Md., Baltimore	3 p.m., Aug.	27.. Reinforced concrete bridge	O. E. Weller, Chm. State Rds. Comm.
O., Cincinnati	Aug. 28	.. Reinforced concrete bridge	County Commissioners.
Cal., Merced	10 a.m., Aug.	28.. Concrete floors and abutments	P. J. Thornton, Clk. Mercer Co. Bd. Supvrs.
N. M., Santa Fe	Aug. 29	.. Four span steel bridge across Rio Grande	J. A. French, St. Engr.
Pa., Pittsburgh	noon, Aug.	29.. Reinforced concrete arch bridge	R. J. Cunningham, Alleghany Co. Comptroller.
O., Findlay	1 p.m., Aug.	29.. Bridge	Hancock Co. Comr.
Kan., Lyndon	Aug. 31	.. Reinforced concrete bridge	County Engineer.
Wash., Seattle	Aug. 31	.. Bridge	County Comrs.
O., Tiffin	1.30 p.m., Sept.	5.. Concrete arch bridge and paving approaches	J. E. Hershberger, Co. Aud.
N. D., Medora	Sept.	7.. Bridge	Billings Co. Comrs.
Cal., Senora	Sept.	7.. Conc'nt	W. E. Newell, Tuolumne Co. Sur.
Ind., Vincennes	2 p.m., Sept.	8.. Two bridges	John T. Scott, Knox Co. Aud.
Neb., Lexington	Sept.	11.. Two bridges	A. S. Gilland, Dawson Co. Clk.
Tenn., Chattanooga	Sept.	15.. Bridge	Hamilton Co. Bridge Comm.
Md., Annapolis	Noon, Sept.	15.. Bridge and paving approaches	O. E. Weller, Chr. State Road Com., Baltimore.
Ont., Toronto	Noon, Oct.	5.. Bridge over Bloor Street	H. C. Hocken, Mayor.

MISCELLANEOUS.

Pa., Philadelphia	Aug. 22	.. Household waste collection	Chief Connell, Strt. Cln. Dept.
Tex., San Antonio	Aug. 24	.. Two garbage incinerators, 45 tons daily capacity or three of 30 tons cap.....	City Council

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill.	Springfield	2 p.m., Aug. 24.	80-ft. brick pipe tunnel, one air compressor and 1,500-ft. underground two-pipe steam conduits for various state institutions	Frank P. Whipp, Fiscal Supvs. Ed. Admn., Capitol Bldg.
O.	Youngstown	Noon, Aug. 24.	Installing vacuum cleaning system	W. N. Ashbaugh, Dir. Schools.
Cal.	Los Angeles	2 p.m., Aug. 25.	Furnishing delivery truck	Board Education
N. Y., New York		Noon, Aug. 25.	General Construction of county court house	C. J. McCormick, Pres. Richmond.
Ind.	Indianapolis	Noon, Aug. 25.	65,000 sets of auto number plates	L. G. Ellingham, State Secy.
Ont.	Ottawa	10 a.m., Aug. 25.	2,500,000 bbls. Portland cement	L. K. Jones, Sec. Dept. Rys. & Canals
O.	Columbus	Noon, Aug. 25.	Shelter and recreation building	Clayton Cain, Aud. Franklin Park Board Comrs.
Ill.	Chicago	11 a.m., Aug. 27.	Constructing head house, Pier No. 2	E. C. Shankland, Chn. Harbor & Subway Com.
Cal.	San Diego	11 a.m., Aug. 29.	Coal hoisting tower	Bur. Yds. & Docks, Wash.
La.	New Orleans	Aug. 30.	Wire & cable for sewage & water board	D. C. Geo. G. Earl, Gen. Supt. Sew. & Water Board
Ala.	Montgomery	Aug. 31.	20,000 barrels Portland cement	E. I. Brown, U. S. Engr.
Pa.	Harrisburg	10 a.m., Sept. 1.	Furnishing motor vehicle license plates	E. M. Bigelow, St. Hwy. Com.
Del.	Wilmington	11 a.m., Sept. 8.	Dredging in Tuckerton Creek, N. J.	E. N. Johnston, Maj. of Engrs. U. S. Engineer Office.
Fla.	Jacksonville	Noon, Sept. 10.	Interlocking steel sheet piling bulkheads for dock, and dredging	S. W. Bruce, Engr. Port Com., 315 Realty Bldg.
Va.	Roanoke	Sept. 15.	Constructing new city hall	City Engr. Gibboney.
Pa.	Philadelphia	Oct. 16.	Garbage disposal	Morris L. Cook, Dir. Pub. Wks.

STREETS AND ROADS

Oakland, Cal.—Council has decided that Edgerly St. from the southeastern line of 55th Ave. to the northwestern line of 57th Ave. be graded, curbed with redwood, paved with an oil macadam pavement and guttered with concrete gutters, three ft. in width.

Oroville, Cal.—The Butte County Supervisors have decided that all four streets upon which Butte County Court-yard fronts shall be paved. Accordingly Board has advertised for bids to be opened on 22d of August. Mayor G. W. Braden has announced that city will order paving of its share of streets fronting Court-yard.

Red Bluff, Cal.—County Supervisors have voted to purchase \$195,000 bonds for construction of road from Butte County line through Los Molinos to Red Bluff.

Sacramento, Cal.—Construction of 64.9 miles of roadway in Mendocino, Humboldt, Santa Clara, Contra Costa, Alameda, Santa Barbara, Grange and Imperial Counties will be started in near future, bids having been opened by State Highway Commission. Bids were for following sections of road: Mendocino County, from 2 1/4 miles north of Hopeland to Ukiah, about 11.4 miles in length. Santa Clara County, from the northerly county boundary to San Jose, about 6.8 miles. Humboldt County, from Miranda to Dyerville, 13.8 miles. Santa Clara County, from Santa Clara to San Jose, 1.9 miles. Contra Costa County, from San Pablo Creek to Pinola, 3.6 miles.

Sacramento, Cal.—Bids will be called for to be opened Aug. 31 for construction of 7 miles of concrete roadway between Folsom and White Rock, on Placerville highway. Bids will also be called for covering 3 1/2 miles in Glenn County between Willows and southerly boundary, with estimated cost of \$80,396.91; also strip 17 miles long between Weed and Dunsmuir in Siskiyou County to cost not more than \$79,705.48, and a mountainous 5-mile strip in Santa Barbara County, between Alcatraz and Las Cruces, to cost not more than \$96,725.20.

Denver, Colo.—State highway commission decided on immediate distribution of some \$20,000 among several counties to be used on road work. One thousand dollars goes to Jefferson county to complete Denver-Morrison road. Various other counties drew sums as follows: Larimer, \$3,000; Garfield, \$2,500; Rio Blanco, \$1,000; Pitkin, \$1,000, and Douglas, \$5,600.

Fort Morgan, Colo.—Section of road here is to be improved at cost of about \$1,400.

Manchester, Conn.—Selectmen have decided to construct walks and curbs on number of streets.

New Britain, Conn.—Construction of concrete road between Allen street and end of state highway beyond Ibelle's corner, is one of improvements which board of public works is now working for.

Jacksonville, Fla.—At short session of Public Service Committee of City Council it was decided to recommend to Public Works Committee of Board of Bond

Trustees that two appropriations of \$5,000 each be consolidated so as to open 8th St. eastward to Talleyrand Ave.

Valdosta, Ga.—Plans are being advanced by commissioners of Lowndes county for improvement of roads. There is some discussion of call for election to determine issue of \$50,000 or \$75,000 in bonds and employment of capable engineer for building of concrete structures.

Pekin, Ill.—Plans and specifications for state aid road which is to be built south of Pekin, are ready for approval of board of supervisors.

Sterling, Ill.—Plans are being made by Mayor and members of Streets and Alleys Committee for opening of Fourth Ave. to river.

Sterling, Ill.—County Clerk W. W. Warner has received specifications regarding work on state aid roads in Whiteside County from State Commission. Special session of Board of Supervisors has been called to consider plans and return them to commission, as is required by law. Whiteside County has appropriated \$13,145 for state aid roads during this year and next.

Fort Wayne, Ind.—On Sept. 5 election will be called to decide whether votes favor grading, draining and paving three roads.

Indianapolis, Ind.—Resolution for paving Bellefontaine street from Thirtieth street to Sutherland avenue has been confirmed.

Peru, Ind.—Plans and specifications for improvement of West Fifth street have been adopted by council and declaratory resolution for same has been ordered prepared.

Council Bluffs, Ia.—Council will construct sidewalks either of concrete or artificial stone.

Oskaloosa, Ia.—Paving of several streets is being considered.

Waterloo, Ia.—Purchase of 8,000 gals. more of oil is recommended by City Engr. Roby.

Waterloo, Ia.—Bids will be received for following improvements: Asphaltic concrete, 12,616 sq. yds.; curb and gutter, 9,916 lin. ft.; plain curb, 300 lin. ft., and plain gutter, 176 lin. ft. R. L. De Gor is City Clerk.

Manhattan, Kan.—New road, 400 feet shorter than one which it will supplant has been planned by A. R. Losh and C. N. Felps of highway engineering department in Kansas State Agricultural college extension division. Road is Godwin Hill road in Ashland township, Riley county.

Topeka, Kan.—County Commissioners have decided to macadam road which extends from north approach of brick yards bridge, north to lower Silver Lake road.

Louisville, Ky.—Steps have been taken to make Market St. one of best thoroughfares connecting eastern and western sections of city when Board of Councilmen passed ordinances for its improvement between 34th St. and Fontaine Ferry Park. Granite cubes, bituminous concrete and brick will be used. Before work of paving is begun gas, water and sewer pipes will be installed.

Baltimore, Md.—City will pay for regrading sidewalks, which were heightened by new roadbed grade.

Gloucester, Mass.—Tentative allotment of \$10,000 has been made by state highway commission, since city expresses willingness to pay \$8,000 for improving Essex avenue.

Great Barrington, Mass.—Representative J. B. Hull, Jr., has received letter from James W. Synan, State Highway Commissioner, announcing that it was voted to expend sum of \$12,500 on state road leading to Three Mile Hill, that "Molasses Hill" road in Egremont would be improved, that mile or more of state road would be built on under mountain road in Sheffield, and that sum of \$10,000 was voted to build state road from Connecticut line towards Sheffield and that latter town would expend an additional sum of \$6,000.

Newton, Mass.—Though Board of Aldermen of Newton turned down project to widen part of Boylston street, Newton Upper Falls, which is old Worcester turnpike, street will be widened by order of County Commissioners and cost, \$25,000, will fall on city.

Pittsfield, Mass.—In meeting of Finance Committee after joint meeting it was voted to recommend that order be introduced in city government appropriating \$34,000 for paving of West and New West Sts., work to be done this season.

Springfield, Mass.—Finance Committee has voted to recommend to City Council bond issue of \$34,000 to pave New West street under the so-called paving act.

Dowagiac, Mich.—It has been resolved that several walks be constructed.

Kalamazoo, Mich.—The \$96,000 city and street improvement bonds have been signed by Mayor Connable and City Clerk Miller, and are being held in city's vault pending formal approval of bonds by Detroit Trust Co., attorneys. Entire bond issue was purchased by Detroit Trust Co., from Kissell-Kinnicutt Co. of Chicago.

Vermontville, Mich.—The Twp. is planning to purchase road roller and stone crusher. Address Town Clerk for further particulars.

Duluth, Minn.—Improvement of Seventh alley between Lake avenue and First avenue east has been ordered. Estimated cost of gravel is \$1,127.85; macadam, \$1,688.61, and concrete, \$1,585.74. Improvement of alley parallel to Patrick factory on Fifth avenue has been ordered. Estimated cost is \$870.10.

Joplin, Mo.—City will pave one street with macadam and another with creosoted wood block.

Joplin, Mo.—It is proposed to pave Byers avenue from Fourth street to Glenview Place with asphalt, brick or wood blocks.

Springfield, Mo.—Bids will be advertised about Sept. first for the following paving: 620 sp. yds. conc. on Market St., 12,639 sq. yds. asphaltic conc. on Kimbrough St., 2,863 sq. yds. Sarcolithic on Convention Hall Ave. & Phillips St., and relaying 3,050 sq. yds. brick on Council St. J. H. Langston, City Clk., S. R. Fisher, City Engr.

Atlantic City, N. J.—Resolution offered by Freeholder Carsuglia that county construct road running from Hammonton to Cumberland County line, distance of 14 miles, has been adopted and bids will be advertised for.

East Orange, N. J.—Ordinance is being considered for laying of concrete sidewalk on N. Maple Ave. L. E. Rawley is City Clerk.

Elizabeth, N. J.—City will repair and resurface several telford and macadam streets with asphaltic concrete.

Elizabeth, N. J.—Ordinance was passed to order the curb line of Stiles St., between Magie St. and Westfield Ave., to be changed so as to be of a uniform width of 16 ft. on each side of the center line of street, and to repair or resurface under open specification plan with asphalt concrete and cause curb to be relaid or replaced in concrete in accordance with the city specification, South St. from Williamson St. to South Broad St. and South Broad St. from South St. southerly connecting with new pavement laid by Public Service Railway Co.; to order and cause Caspian St. from 1st Ave. to 3d Ave. to be paved with brick pavement on concrete foundation, and order Baltic St., from 1st Ave. to 3d Ave. to be paved with brick pavement on concrete foundation.

Freehold, N. J.—It is reported that board of freeholders may vote state aid and improve Riverside Drive.

Gloucester, N. J.—Ordinance has been passed to provide for construction of sidewalks, removal of encroachments therefrom, paving and curbing thereof, of Harrison Ave., Garfield Ave., Cleveland Ave., Baptist Lane, in village of Blackwood, in Township of Gloucester, in County of Camden. Thos. H. Beetle is Township Clerk.

Newark, N. J.—The extension of 16th and 18th Aves. to Sanford Ave. has been unanimously recommended.

New Brunswick, N. J.—An ordinance has been passed by council providing for the regulating, grading and curbing of number of streets.

Newton, N. J.—The line of proposed macadam road from Ross's Corner to Sussex Borough has been completed by County Engineer Harvey Snook's corps of surveyors. Length of proposed road will be 6.55 miles. Cross-sectioning of road for part of way remains to be performed.

Paterson, N. J.—Improvement of charcoal road, between Greenwood Lake Glens and Stirling Forest has been discussed by Passaic County Board of Freeholders. County Engineer Garwood Ferguson was instructed to prepare plans and specifications and to submit an estimate of cost. Highway is about three and one-half miles long. A rough estimate places the cost at about \$80,000.

Herkimer, N. Y.—Bids will be asked for construction of sidewalks.

Ithaca, N. Y.—At joint special meeting of Board of Trustees and Board of Street Commissioners plans and specifications for paving Otsego St. with bitulithic pavement with state aid were approved and returned to State Commission of Highways at Albany.

Lockport, N. Y.—Bids have been received by Common Council for paving of Orchard St. with asphalt block and for construction of drains and water pipes in Rogers and Harrison Aves. They were referred to committee on streets and are as follows: Orchard St. paving, C. B. Whitmore Co., \$2,968; C. N. Sainthorpe & Co., \$3,199.70; Rogers Ave. pipes, C. B. Whitmore Co., \$1,376; F. J. Le Valley, \$1,100; Harrison Ave. pipes, C. B. Whitmore Co., \$2,840; F. J. Le Valley, \$2,510.

Wilmington, N. C.—City Council has decided in favor of immediate improvement of both sides of Market street, from 10th to city limits at 17th, with bitulithic, entire expense of improvement, which will approximate \$37,000, to be borne by municipality. Resolution authorizing improvement will be adopted at weekly meeting of Council and bids will then be advertised for under specifications prepared by City Engineer.

Wilmington, N. C.—City Council has passed resolution providing for improvement of Market St. from 10th to 17th, with bitulithic, at cost of approximately \$37,000. Bids are to be called for right away.

Columbus, O.—Plans are being discussed for completion of road from Columbus through Chattahoochee County.

Dayton, O.—The County Commissioners have acted favorably on petition for improvement of township road running from county line in Perry Township to Brookville, and improvement is in progress. Work, it is estimated by Commissioners, will cost \$2,700.

Defiance, O.—Petition signed by S. E. Greek and others has been filed with County Commissioners praying for grading, stoning and improving of road beginning at northeast of section four,

Mark township, thence running south on line with public highway distance about three and a half miles to intersection of B. & O. railway in Mark Center.

Massillon, O.—Bond issue of \$10,700 was authorized for paving Front St.

Newark, O.—Service Director W. C. Christian will advertise for bids for following street improvement work: Paving—Elizabeth, Maple Ave. and 7th St. Sewering—Park Ave., Webb, Ballard, Penney, Lawrence and Arch Sts.

Hood River, Ore.—Bids will soon be called for paving three sections of the Columbia River Highway.

Junction City, Ore.—Council ordered improvement of Fifth street from Ivy to county road and of Juniper from Sixth to Fifth.

Altoona, Pa.—City will soon construct vitrified brick pavement on concrete foundations on about 11 streets. In some cases curbing will also be done. W. J. Hawer is City Clerk.

Bethlehem, Pa.—Northampton County Commissioners have decided to spend several thousand dollars in resurfacing 9 miles of pike between Bethlehem and Nazareth.

Dark, Pa.—According to Highway Committee cost of improving borough streets will cost over \$48,000.

Franklin, Pa.—Ordinance is being considered providing for curbing and paving of Buffalo St., beginning on southerly side of 9th St., thence southwardly to southerly side of 4th St.

Harrisburg, Pa.—Ordinance was passed to authorize paving and curbing of Market street from west side of Nineteenth street to east side of Twenty-first street; to authorize paving and curbing of Nineteenth street from Market street to Chestnut street; to authorize grading of Brookwood street from Seventeenth street to Sixteenth street.

Hazleton, Pa.—County Commissioners have filed petition with Court asking for authority to take over and improve a mile and a half of highway in Dorrance Township.

Lewistown, Pa.—Two ordinances, one for paving of Dorcas street from Market street to Water street and other for paving of Main street from Monument Square to Green Avenue, have passed second and final reading. Another motion was passed directing street committee to prepare plans and specifications for grading and paving of Dorcas and Main streets.

Steelton, Pa.—City will pave Conestoga St.

Williamsport, Pa.—The Montoursville Road between Millers Lane and Loyalsock bridge will be oiled by State immediately upon completion of present resurfacing operations or as part of them.

Providence, R. I.—In a resolution to be presented to council it is advocated that the surfacing of Westminster street from Market square to Aborn street and of Weyboset street from Turks Head to Richmond street be wood block in place of the granite blocks now in use.

Woonsocket, R. I.—See "Sewerage."

Abingdon, Va.—With view of getting estimate of cost for completion of Abingdon-Lebanon macadamized highway, Alex Stuart, of Abingdon, requested state highway department to go over road.

Centralia, Wash.—Commission passed resolution calling for paving of North Tower avenue from 4th to 5th streets and 5th street from Tower avenue to viaduct leading to the Logan district.

Racine, Wis.—Bids for paving of roadway leading to Isolation Hospital and Sunnyrest Sanitarium have been taken up. It was found that Fred Nelson's bid was lowest for kind of pavement city desires, which is asphaltic macadam. This kind of pavement will cost \$4,993.35, of which amount county will pay \$2,672.45 and city \$2,320.90. Contract for paving was not awarded.

Superior, Wis.—Application for \$5,000 of state aid money will be made by County Road Commissioner, C. J. Morisset. Money will be for work done on three roads.

CONTRACTS AWARDED.

Montgomery, Ala.—For constructing Big Swamp and Hayneville and Lowdensboro road, to Jordan & Phillips, Lowdensboro.

Alhambra, Cal.—Mesmer & Rice, Story Bldg., Los Angeles, were awarded the contract at about \$30,000 for the construction of a reinforced concrete arch culvert and fill across Mill Creek at Main St. between the cities of Alhambra and San Gabriel, in accordance with plans and specifications prepared by

Charles E. Hewes, City Engr. of Alhambra.

Inglewood, Cal.—The following bids were received for improving Severance St. and Manchester Ave., engineer's estimate \$17,439.57: (a) W. F. Hewitt Co., \$17,485.13; (b) J. Hein and David E. Sheehan, \$17,621.10. Itemized bids: 2663.57 lin. ft. macadam, (a) \$3.79, (b) \$4.00; 25,329.73 sq. ft. sidewalk, (a) 12c, (b) 10½c; 5064.85 lin. ft. curb, (a) 37c, (b) 35c; 7163.64 sq. ft. con. gutter, (a) 19c, (b) 15c; 165.61 sq. ft. vit. br. gutter, (a) 36c, (b) 35c; 3 cor. iron culverts, (a) \$1,055, (b) \$1,400. Paul E. Kressly, Cit. Engr.

Sacramento, Cal.—Contracts for construction of roads in various sections of State, aggregating expenditure of \$200,000, have been awarded by Advisory Board of State Department of Engineering. Awards were as follows: Humboldt County, from Miranda to Dyer-ville, 13.8 miles; Fairbanks & Baechtel, Willits, \$120,893. Contra Costa County, from San Pablo Creek to Pinole, 3.6 miles, James H. Falconer, Escalon, \$14,433.30. Santa Clara County, from Santa Clara to San Jose, 1.9 miles, Ransome, Crummie Co., Oakland, \$36,664.50. Santa Barbara County, from El Capitan Creek to Alcatraz, 9.3 miles, T. K. Beard, Modesto, \$82,168. The bids for road construction in Humboldt County from Shively to Jordan Creek were rejected, all being in excess of the engineer's estimate.

Naugatuck, Conn.—Contract for repairing Church street from Maple street to gravel road near golf links, has been awarded by state highway department to Gregory and Merritt, of Greenwich. They will begin work here as soon as possible.

DeLand, Fla.—Contracts were let for shelling DeLand-DeLeon Springs Rd. through Broomville and Glenwood sections. Bids were let in three sections. H. W. Pursell was successful bidder from DeLeon Springs, section 3, for \$6,000; sections 1 and 2 were let to W. G. Cannons, of DeLand, for \$5,835 and \$7,835 respectively.

Chicago, Ill.—Contracts for cement sidewalks were let to: General Cement Construction Co., A. C. Shafgold, Bairstow Supply Co., H. P. Larsen, Albert Graff, J. J. Ferry, A. R. Anderson, Hanson & Undine Co., W. R. Ashton.

Huntington, Ind.—For paving 1st St., 10,100 sq. yds., to C. C. Huffine & Co., Frankfort, at \$1.89 to \$2.29 per sq. yd. H. I. Young is City Clerk.

Dubuque, Iowa.—Contracts for number of street improvements were let by city council as follows: For improvement of Jones street, C. B. McNamara & Co.; for improvement of Dunning avenue, Tibey Bros.; for improvement of Henderson avenue, Tibey Bros.; for improvement of alley from Seventeenth street to Eighteenth street, between Clay and White streets, Thomas Lee; for improvement of Grove terrace, J. M. Kenety; for improvement of Highland place, James F. Lee; for improvement of South Locust street, C. B. McNamara & Co.; for improvement of Twelfth street, J. M. Kenety; for improvement of Arlington street, J. M. Kenety; for improvement of Olive street, James F. Lee; for improvement of West Eleventh street, James F. Lee; for improvement of Walnut street, Wilmer Cook.

Atkinson, Kan.—Tom Beattie was lowest bidder for macadamizing of mile of Monrovia road, west from Omaha Junction crossing, at his bid of 95 cents per linear foot for rock and gravel work, and 30 cents per yard for grading, amounting to \$5,421, all told.

Baltimore, Md.—Following are bids opened by State Roads Commission, Baltimore: Baltimore City—P. Flannigan & Son, Baltimore, sheet asphalt, .54 mile, \$25,826. Dorchester County—5.85 miles, Humphrey-Bentley, Elizabeth, N. J., macadam, \$59,103 or concrete, \$72,086; Ambler-Davis, Harrison Bldg., Philadelphia, Pa., bituminous concrete, \$77,830. Washington County—4.1 miles, Winston & Co., 290 Bway., New York, macadam, \$37,644, or concrete, \$44,596. Washington County—3.5 miles, Carozza Bros., 603 Bunsey Bldg., Baltimore, macadam, \$59,087, or concrete, \$73,337. Somerset County—5.32 miles, Humphrey & Bentley, Elizabeth, N. J., macadam, \$59,434; Field-Barker-Underwood, Arcade Bldg., Philadelphia, Pa., concrete, \$65,522. Prince George County—3.03 miles, Lyon Bros., Oregon Ave., Washington D. C., concrete, \$33,024, or gravel, \$16,605. St. Mary's County—10 miles gravel (2 sections), Luck Constr. Co., Roanoke, Va., only bidder, \$38,619 and \$24,258. Allegany County—1.74 miles, surfacing, no bids received.

Baltimore, Md.—Among contractors who bid on paving work were Baltimore Asphalt Block and Tile Company, \$10,938.50, and P. Flanigan & Sons, \$10,949.50. There was difference of \$11 in two bids and former concern was awarded contract. Streets to be paved are Twenty-third, between Charles street and Guilford avenue; Twenty-fourth, from St. Paul to Charles streets and Westwood avenue, between Thomas and Whitmore avenues.

Sturgis, Mich.—For 22,075 sq. yds. sheet asphalt pavement by City Council to F. F. Paxton Co., Chicago, Ill.

Duluth, Minn.—No opposition to paving of two miles of the New Duluth road developed at Council and contract was awarded to D. H. Clough & Co., on their bid of \$48,280. Improvement calls for an 18-foot concrete roadway on Zimmerly avenue from Ninety-third avenue west to Commonwealth avenue and on Commonwealth avenue to main line of the Spirit Lake Transfer Company.

Hibbing, Minn.—For paving 8,000 sq. yds. on McKinley St. and 5th Ave. by City Council to Butler-Coons Contr. Co., at \$2.42 per sq. yd. for bitulithic, and \$2.49 per sq. yd. for creosoted blocks.

Nashwauk, Minn.—By Village Council, contract for paving of two blocks on Second street to Mallroy & Dyson of Eveleth, who were lowest responsible bidders. Following bids were given for three blocks as was decided by council, but later one block on Third to have been paved was dropped until later: Tweed & Latvala, \$12,237.50; McDonald & McKusick, \$11,700; Mallroy & Dyson, \$11,160.

Boonville, Mo.—For 6,818 sq. yds. concrete pavement to F. Stretz & Sons, Boonville. They bid for alley pavement 75 cts., streets 85 cts. and 90 cts. per sq. yd., and for all curb 25 cts. per lin ft. Chas. G. Miller is City Clerk.

St. Louis, Mo.—Following contracts have been awarded by Bd. Pub. Improv. for paving as follows: Oakland avenue, from Clayton avenue to Clayton avenue and Skinner road, to Webb-Kunze Constr. Co., 5927 Fyler avenue, as follows: Grading and repairing roadbed for superstructure, including rolling, 9,419 cu. yds. at 35 cts.; granite curb, 5,156 lin ft., 80 cts.; vitr. brick block alley entrances, gutters and crosswalks, on concrete base, 1,832 sq. yds., \$1.80; lower course of Telford pvt., 1,722 sq. yds. of 100 superficial ft., \$4.25; macadam, 1,154 squares of 100 cu. ft., \$5.25; gravel, 396 squares of 100 cu. ft. at \$6; rolling, 32 days, at \$20 per day; loam, sand or macadam screenings, 431 squares of 100 cu. ft., at \$5.50. Total, \$29,087. For paving viaduct on 12th St., from Spruce St. to Chouteau avenue and sidewalks along approaches to Fruin Colon Contr. Co., Laclede Bldg., as follows: 1,244 lin. ft. granite curb, 82 cts.; 38,100 cu. ft. concrete in roadway foundation, 15 cts.; 83,100 sq. ft. wood block pvt., 17 cts.; 9,930 sq. ft. plain sidewalks, 13 cts.; 1,050 sq. ft. reinforced sidewalk, 30 cts.; 1,160 lin. ft. light house conduits, 20 cts.; manholes, frames and covers (lump sum), \$200. Total, \$22,899.

Missoula, Mont.—For paving 7 miles Bitter Root Hole Road to Clifton, Appliance Co., at about \$13,900.

Albany, N. Y.—Contracts reported awarded by Board of Contract and Supply for repaving follow: To Kenny & Dumar, Albany, for Columbia, Orange, Van Tromp and Steuben Sts., \$17,559; Wilkins Ave., \$9,080, and Jay St., \$9. to John W. Davitt, Troy, N. Pearl St., from Clinton Ave. to Livingston Ave., \$17,294; to Geo. Holler, Albany, concrete walks on Bway., \$6,654, and to Robt. I. Gleason, Albany, improving Federal St., \$4,102.

Batavia, N. Y.—For paving with brick, Walnut street, by Bd. Aldermen, to McKitney-McGuire Constr. Co., Niagara Falls, at \$13,597.

Herkimer, N. Y.—Warren Brothers' Co., of Boston, has been awarded contract for paving of Smith St., between Main St. and Dewey Ave., with bitulithic pavement, with Medina sandstone curbing. Bid was as follows: Pavement, \$2.18; \$1, circular curbing; 90 cts., straight curbing; 50 cts., headers; \$35, catch basin; 40 cts., vitrified sewer pipe.

Long Island City, L. I., N. Y.—Clancy & Van Alst were lowest bidders on contract to regulate, grade, curb, flag and pave with granite block on 6-inch concrete foundation Thomson avenue, from viaduct to Diagonal street, Long Island City, their figure being \$45,407. Joseph Di Menna, placing cost at \$20,727, was lowest bidder for similar work on Liberty avenue, from Brooklyn Borough line to Walker avenue, Woodhaven.

Mamaroneck, N. Y.—Bids for laying 500 feet of concrete and cement sidewalk in Mamaroneck and Railroad avenues have been received as follows: Daly & Merritt, rock excavation, \$2.00 a yard, sidewalk 25 cents a square foot. Joseph Dimando, rock excavation, \$2.00 a yard, sidewalk 18 cents a square foot. Frank E. Murray, rock excavation, \$2.00 a yard, sidewalk 20 cents a square foot. Faillace Brothers, rock excavation, \$2.00 a yard, sidewalk, 16½ cents a square foot. Contract was awarded to Faillace Brothers, the lowest bidder.

Peekskill, N. Y.—Following are bids offered for paving Ninth street: John Smith, Jr., bid at \$1,947; Philip Travis Co., Inc., at \$1,700, and Frank McCord, at \$1,478. Contract was awarded to Frank McCord, lowest bidder.

Wilmington, N. C.—Bids for grading sidewalks on 4th St. from Castle to Greenfield, ranging from \$350 to over \$3,000 have been opened. Contract was awarded to J. M. Potter of Wilmington, whose bid of \$350 was lowest received. Other bids were as follows: Ben Lane, \$395; J. M. Woolard, \$1,471; J. B. Davis, \$3,048.64. Work is to be done under supervision of city engineer.

Springfield, Ohio.—Contract for paving of Clairmont avenue between High street and Elmwood avenue was awarded to Contractor W. F. Payne.

Oregon City, Ore.—Contract for improvement of 15th St. from Monroe to Jackson was awarded to Oregon Engineering & Construction Co. for \$5,333 over J. W. Shea. The improvement is to be macadam.

Tulsa, Okla.—For paving with asphaltic concrete about 35 blocks of streets by City Commission to F. P. McCormick, Tulsa, at \$1.34 per sq. yd.

Catawissa, Pa.—Contract was awarded to Horsehead Construction Co., Horsehead, N. Y., for material for a creosote block walk on Catawissa river bridge. In inviting bids for work Commissioners asked for bids for material, to include cost of placing it in position, and for bids for material alone. Horsehead Co. bid \$1,092 for material and \$1,593 for material and laying it.

Lebanon, Pa.—Council in special meeting with Mayor John P. Longenecker presiding, has approved the \$30,000 bonds of the Franklin Construction Co., contractors, who will pave 8th and Cumberland streets.

Philadelphia, Pa.—In announcing award of grading and paving contracts to amount of \$300,000, for which bids were received, Chief Connell, of Highways Bureau, says that there will result great saving to city as result of keen competition among about 40 bidders. There are 15 contracts for grading, bids ranging from 20 to 59 cents per cubic yard, with an average of 30 cents. Last year average of prices for grading was 45 cents. For asphalt paving, bulk of work went to Eastern Paving Company, at prices ranging from \$1.49 to \$1.68 per square yard, average price of \$1.60 as against \$2.10 which Chief Connell says was paid last year. Asphalt repaving, on which Union Paving Company was low bidder for all work, was awarded on uniform price of \$1.42 per square yard, as against the average price of \$1.90 paid last year. The vitrified block pavement went to Vincent Jafolla, Mack Paving & Construction Company, and the Cunningham Paving & Construction Company, at prices from \$2.55 to \$2.67. The average price is \$2.60 as against \$2.90 for last year's work. For surfacing country roads the prices ranged from 83 cents to \$1.39 per square yard, and the work awarded to the Union Paving Company, J. J. Sloan, John McMenamy and the Newton Paving Company. The Union Paving Company was low bidder for five contracts for resurfacing country roads, at 54 cents for waterbound macadam, and 98 cents to \$1.16 for bituminous macadam.

Reading, Pa.—J. E. Weidner, of Reading, has been awarded contract for paving 7,000 square yards of Reading streets with brick at \$18,500.

Olympia, Wash.—Two large contracts have been obtained by Washington Paving Co., \$81,000 paving contract from Olympia and a \$31,000 contract with Linden, Whatcom Co.

Port Angeles, Wash.—For grading bulkheading in L. I. District No. 20, to Lewis, Wiley & Morse, Central Bldg., Seattle, at \$19,000.

Seattle, Wash.—Following contracts have been awarded: Alley, block 23, C. D. Boren's Add., grading, etc., to Wenzler & Ward, \$2,239.95; Second avenue N. E., grading, etc., to Crane & Johnson, \$3,931.70; Forty-second avenue S.

W. et al., concrete walks, to D. H. Trapagen, \$25,541.35.

Cheyenne, Wyo.—Odell Bros. have been awarded contract to construct last link in Cheyenne-Fort Collins road from Wellington, Colo., to Wyoming line. Larimer County has appropriated \$4,209.66 for work.

Peterboro, Ont.—Contract for asphaltic concrete paving on concrete base has been awarded to Foley & Gleeson, Central Chambers, Ottawa, at \$82,137.

SEWERAGE

Glenwood, Ark.—City is considering \$100,000 bond issue for sewer system and water works.

Hapeville, Ga.—City will vote Sept. 7 on \$14,000 bonds to construct sewer system. John D. Humphries is Mayor.

Hartwell, Ga.—City will vote Sept. 2 on \$13,000 bonds for construction of sewers.

La Porte, Ind.—Resolution has been approved for construction of district sewers in Larson street. Wm. F. Krueger is City Clerk.

La Porte, Ind.—Board of Works has approved plans for Larson street sewer. Sewer will be extended from Lake Shore tracks and Heinze street north of Heinze two squares to Bach street, two squares east on Bach to Larson street and along Larson to and across the L. E. & W. track along proposed extension of Larson street to Darrow avenue. Total length of sewer is 3,200 feet and it is to be of 20-inch and 18-inch pipe.

Peru, Ind.—City will build lateral sewers between Seventh and Eighth St. from Cass St. to first alley in Cass St. Plans and specification were ordered for sewer between 9th and 10th Sts. from Tremont to Grant Sts.

Council Bluffs, Ia.—Council has decided to construct sewers in several streets. Charles J. Duff is City Clerk.

Creston, Ia.—City Council has passed resolution for construction of 6 in., 8 in. and 10 in. sanitary sewers on various streets. J. F. Golden is City Clerk. Job contains about 1,160 lin. ft. 12 in. pipe, 2,890 lin. ft. 10 in. pipe, 8,622 lin. ft. 8 in. pipe, and 12,930 lin. ft. of 6 in. pipe. Theo. S. De Lay is City Engineer.

Louisville, Ky.—City will construct sewers and drains in several streets and also sidewalks.

Louisville, Ky.—A bid of \$18,099.99 from Middletown Construction Company for laying of sewer through eastern section of Oakdale, suburb south of Louisville, was lowest opened at meeting of the Oakdale Council. Eight were submitted and all were turned over to commission for final inspection. Plans call for laying of trunk line about a mile long, which will connect with main outfall on Third street boulevard.

Lawrence, Mass.—City is to install a 10-inch sewer pipe on Platt Court near Rollins school.

Flint, Mich.—Bond issue will be asked in order to build 16 proposed storm and 31 sanitary sewers.

Flint, Mich.—Construction of storm sewers in about 16 streets, and sanitary sewers in about 28 streets, has been ordered.

Duluth, Minn.—Sanitary sewer has been ordered in Allendale avenue from point 660 feet north of Anoka street to Isanti street, with branch in Anoka street between Allendale and Minneapolis avenues.

Camden, N. J.—Sewers and drains will be constructed by city on several streets.

Camden, N. J.—Ordinance has been passed authorizing construction of sewers, culverts or drains in and along Sycamore St., from 9th St. to 10th St.; 26th St., from Federal St. to Mickle St. W. D. Brown is City Clerk.

Elizabeth, N. J.—Ordinance was passed to build and construct a sewer, together with house drainage connections, in Anna St. from Division St. to a point about 735 ft. from Henry St.

Perth Amboy, N. J.—Township Committee will construct vitrified pipe sewer.

Binghamton, N. Y.—The construction of two sewers in Sixth Ward, which will be first portion of intercepting sewer system, which State insists must be built at once, will be ordered by Common Council. One sewer is estimated to cost \$18,000 and is to run along bed of old canal, and will be outlet for all other Fifth and Sixth Ward sewers. Other will be built in portion of Sixth Ward, as yet undrained.

Bismarck, N. D.—Plans and specifications have been completed and sent out by state engineer for the construction of two drainage ditches in Pembina County. One drain is 5.13 miles in length; other

is 6.69 miles in length. Third ditch is a little over five miles in length.

Mansfield, O.—Enlargement of sewage plant is being discussed.

Marion, Ohio.—Resolution has been adopted to construct 4,580 feet of sewer at cost of about \$21,000.

Newark, O.—See "Streets and Roads."

Philadelphia, Pa.—Survey bureau is advertising for bids for nine lines of main sewers to cost approximately \$200,000, and for sixty-six lines of branch sewers to cost approximately \$350,000. Total amount of sewer construction will aggregate ten miles. Additional contracts for construction of inlets, manholes and other incidental sewer work will total about \$20,000. Bids for work will be opened August 26.

Woonsocket, R. I.—Resolution appropriating \$3,500 for purpose of building surface water drain in East School St. from North Main St. to Social pond, was passed, as also resolution appropriating \$18,000 for the purpose of paving and curbing West School St., from Blackstone to North Main St., and resolution appropriating \$28,000 for the purpose of paving, curbing and building a surface water drain in Pond St. from Clinton St. to East School St.

Winnsboro, S. C.—City has voted \$100,000 bonds to construct sewer and water systems and to improve electric light plant. C. A. Robinson is Mayor.

Brownwood, Tex.—City is planning to construct about 2,800 ft. additional sewers.

Burlington, Wis.—Construction of sanitary sewers on Doyer street has been authorized.

Superior, Wis.—Preliminary action on general bond issue of \$23,500 for construction of main sewers in Billings Park and Allouez has been taken by City Commission.

CONTRACTS AWARDED.

Birmingham, Ala.—Contract awarded by Board of Commissioners to H. N. Bowdry to construct sanitary sewers in East Birmingham at \$15,546; work includes 1,250 lin. ft. 15-in. pipe; 660 lin. ft. 12-in.; 2,400 lin. ft. 10-in.; 24,000 lin. ft. 8-in.; 1,280 lin. ft. 4-in. risers; 438 1/8th bends; 125 manholes and 1,050 wyes.

Bridgeport, Conn.—Three sewer contracts were awarded to Pierce Manufacturing Co.

Washington, D. C.—Following are lowest bids opened on Aug. 3 for constructing sewers: Wm. F. Cush, for Maryland Ave., trunk sewer, Sect. 3, also service sewer on Bladensburg Road, \$7,965 and \$1,373, respectively; Jas. W. Bean Contr. Co., for service sewers, Broad Branch Road, Stephenson Place, Murdock Mill Road, 49th St., Butterworth Place, Brandywine St., and Asbury Place, \$3,537; Warren F. Brenizer Co., Rock Creek main interceptor, Sect. 6, Sect. A, in open cut, \$18,855, and to Whiting-Turner Constr. Co., for Rock Creek main interceptor, Sect. 6, Sect. B in tunnel, \$16,349.

Daytona, Fla.—Contracts awarded by City Council as follows: To Bibb Sewer Pipe Co., Macon, for furnishing vitrified pipe; to U. S. Cast Iron Pipe & Foundry Co., Chattanooga, Tenn., c. i. pipe; to J. G. Christopher Co., Jacksonville, galvanized steel pipe; to Gibbs Gas Engine Co., Jacksonville, furnishing oil engines and appurtenances; to N. C. Walpole, New York, furnishing air compressors and appurtenances; to Sanitation Corp., New York, furnishing Riensch sewerage screen; to Gibbs Gas Engine Co., Jacksonville, installing machinery in sewage pumping station; to Guild & Co., Chattanooga, Tenn., excav. and refill, concrete, steel reinforcement, rock excav. and pumping station superstructure; to Shone & Co., Chattanooga, Tenn., construction work, including all necessary material for the work.

St. Augustine, Fla.—By City to Seth Perkins & Sons, St. Augustine, for construction of sewers in connection with street paving. H. G. Perring Engineering Co., Engr., Heard National Bank Bldg., Jacksonville.

Chicago, Ill.—For adjusting sewers, catch basins, etc., contracts were awarded to: Citizens' Construction Company, Calumet Coal & Teaming Co., E. P. McCormick, P. J. O'Brien, J. Dillon, J. A. Lackley Co., Ready & Collaghan Coal Co. For constructing sewers and drains contracts were awarded to S. Ryan, G. Barry, G. Pontorelli, The Ryan Co.

Waukegan, Ill.—By Board of Local Improvements for construction of sewer in Jackson St. and Jackson Court to H. C. Patterson, at \$291.90.

South Bend, Ind.—Contract for pipe sewer on Indiana avenue from Carroll

to Miami St., has been granted to L. H. Webster for \$6,085.52, by board of public works.

Centerville, Ia.—For construction of sewage filters, dosing chamber, etc., to L. W. Manson, Centerville, at \$12,932. M. G. Hall is Engr., Centerville.

Guthrie Center, Ia.—For constructing sewers to Western Construction Co., Iowa City, Ia., at \$32,241, and for disposal plant to F. H. Christensen, Guthrie Center, at \$7,950. Engineers are Bruce & Standeven, Bee Bldg., Omaha, Neb. Seth B. Weeks is City Clerk.

Baltimore, Md.—By City for contract No. 137 to Carozza Bros. & Co., 305 E. Preston St., at \$174,408.85, to construct sanitary lateral sewers and house connections in District No. 43-B; 57,000 lin. ft. vitrified pipe sewer, 8 to 18 in. diam., and 47,000 lin. ft. vitrified pipe house connections.

Baltimore, Md.—Board of Awards has awarded contract to Carozza Bros. & Co., 305 East Preston street, at \$174,409 for construction of sanitary lateral sewers and house connections in Dist. No. 43-B requiring 57,000 lin. ft. of vitrified pipe sewer 8 to 18 in. and 47,000 lin. ft. of vitrified pipe house connections, under contract No. 137. Noted July 23.

Duluth, Minn.—Contract for constructing sanitary sewer in Tacony street between Fifty-ninth and Sixty-first alleys west, has been awarded to Norquist & Berg on their bid of \$1,685.30.

Hannibal, Mo.—For constructing sewers in Sewer District 300, to Frank L. Hall, at \$25,400. Work includes 31,470 lin. ft. 6-in. and 600 lin. ft. 12-in. vitr. pipe, 2,030 lin. ft. 6 x 4-ft., 800 lin. ft. 6 x 6-ft., and 700 lin. ft. 3 x 4 ft. concrete sewer. W. N. Snyder is Asst. City Engr.

St. Louis, Mo.—For both sections of Mill Creek sewer to Carter Constr. Co., 42 Bway., New York, at about \$1,400,000 and \$1,672,000, respectively. W. W. Horner is Engr. Sewer Dept.

Long Island City, N. Y.—Bids opened for constructing sewers: (a) Atlantic Ave., Fulton St., Walnut St., Briggs Ave., Church St., Lefferts Ave., 4th Ward, Borough of Queens; (b) Toledo St. with temporary dry weather flow connections at Maurice Ave., Horton and Ivy Sts., 2d Ward, Borough of Queens; Paino Bros., 684 Degraw St., Brooklyn, (a) \$16,894, (b) \$31,210; Leo E. Kelly, Inc., (a) \$24,057, (b) \$30,898; Peace Bros., (a) \$18,699, (b) \$25,540; Green Contr. Co., (a) \$19,751, (b) \$23,142; Clancy & Van Alst, 401 Bway., Long Island City, (a) \$21,176, (b) \$20,213; Evergreen Contr. Co., (a) \$20,306; Jos. L. Sigretto, (a) \$19,240; King Bros., (a) \$22,047, (b) \$27,807; Amanna & Sullivan, (a) \$25,957; Oak Eng. & Contr. Co., (b) \$30,376. Lowest bid opened Aug. 5 by Borough President for constructing sewers reported as follows: Atlantic Ave., Paino Bros., \$16,894; Ridge St., Peace Bros., \$12,096; Ashland St., Paino Bros., \$6,107; Payntar Ave., Peace Bros., \$5,982; Toledo St., Clancy & Van Alst, \$20,213.

McMinnville, Ore.—Contract for sewer construction has been awarded to V. R. Dennis, Spalding Bldg., Portland, at \$8,252. Vitrified pipe will be used.

Roseville, Pa.—Contract awarded by Borough Council for construction of sewer system to Mr. Hamilton of Oakmont, to include 17,800 lin. ft. 6 and 12-in. vitr. sewer pipe; 160 ft. c. i. pipe and 1,200 ft. of storm basins and manholes.

South Bethlehem, Pa.—For construction of sewer on Centre St. to Thomas B. Briody, of So. Bethlehem.

Williamsport, Pa.—For sewers as follows: Maynard alley, 51-in. segment block sewer to Cantrell Constr. Co., Real Estate Trust Bldg., Philadelphia, \$12,627, and Washington street, 48-in. segment block sewer to E. C. Williams, \$7,987.

Huron, S. D.—To Aiken & Bartlett for lateral sewers.

Seattle, Wash.—By Board of Public Works, for construction of sewers in Seventh avenue N., to John Allemandi, at \$6,460.25.

Milwaukee, Wis.—By Dept. Pub. Wks. for construction of sewer on Hawley Road and Vliet St. to F. H. Nakielci, at \$94,186, and to John Bowler, for relief sewer at Locust St., from N. Pierce to 7th St., at \$45,313.

New Glarus, Wis.—For 2,960 ft. pipe sewers to Kemith Koontz, of Chicago, Ill., for 7,961 sq. yds. concrete pavement to Larson Constr. Co., Oshkosh.

WATER SUPPLY

Birmingham, Ala.—City Engineer Kendrick will soon report on proposed water-works plant. If favorable report is received, the commissioners will, it is said, call a bond election on Sept. 21st.

Richmond, Cal.—Richmond Water District Committee instructed its attorney, D. J. Hall, to issue proclamation for another election on proposed water bond issue to be held Sept. 22. Proposal is to issue bonds to extent of \$2,500,000 to bring water to Richmond directly from Sacramento river.

Freepoint, Ill.—Council petitioned to extend water mains on Orin St. between Harris St. and Wilbur St.

La Salle, Ill.—Election will be held August 27th for voting on ordinance authorizing issuance of water works bonds in sum of \$15,000. J. B. Lawniczak is City Clerk.

Quincy, Ill.—City contemplates the installation of pumping plant for water system at Towhead Island, to cost approximately \$70,000.

Indianapolis, Ind.—The Indianapolis Water Company has been ordered by Board of Public Works to place water mains in Thirty-sixth street, from Central avenue to a point 280 feet east; Holly avenue, from Oliver to Marion avenues; Draper street, from Cottage avenue to Palmer street, and Sheridan avenue, from Washington street to Lowell avenue.

Ackley, Ia.—Special election has been called by the mayor of this city to decide question of purchase of local water works system by city of Ackley. System is now owned by private corporation, and through lack of extension has not proved paying proposition.

Frontenac, Kan.—Committee has been appointed for purchase of new pump for new city well.

Hodgenville, Ky.—It is probable that City Council will order election on proposition to issue bonds for purpose of building waterworks system here. Cost, according to engineer who has just completed survey will be about \$14,000.

Pittsfield, Mass.—Extension of water system in Pontosuc from Lake station to Lanesboro line is being considered.

Rockport, Mass.—Rockport voted to extend 6-in. water main from South St. to the Rockport Country Club, a distance of about 1,500 ft. Bond issue for same to be considered later.

Saginaw, Mich.—Sum of \$5,400 has been appropriated for laying water mains in various streets. H. S. Gay is City Clerk.

Duluth, Minn.—Council has approved seven contracts for extension of water and gas mains. Aggregate of low bids approximates \$10,000. This represents cost of laying mains as pipe is furnished by water and light department.

Duluth, Minn.—Extension of water mains in various side streets has been petitioned for.

Billings, Mont.—City Engineer Durland has sent surveys for proposed water purification plant for municipal system to Burns & McDonnell, consulting engineers, to prepare plans which will be in hands of city authorities about Sept. first, when bids will be called for construction of plant.

Asbury Park, N. J.—Sealed proposals will be received by Common Council of the City of Asbury Park, until August 24th, 1914, at 8 p. m., for purchase of all or any part of \$50,000 4 1/2 per cent. water bonds of the City of Asbury Park of denomination of \$1,000 each to run thirty years.

Montclair, N. J.—Preference for development of Wanaque river water shed as source of water supply for Montclair, as against scheme to purchase East Jersey Water Company's holdings at Little Falls, has been expressed by Montclair Town Council.

Albion, N. Y.—Although village of Albion has been advertising for bids on its \$165,000 bond issue for municipal water works system for past two weeks, necessary amount for purchase of plant of Albion Waterworks Company and for extending system and developing new source of water supply has not been provided. No legal bidders put in appearance on date advertised for selling of bonds, and only single bid was received, offering to take bond issue at 5 per cent. Another attempt will be made to sell the bonds.

Barker, N. Y.—Water system is to be installed. A. J. Todkill has been granted franchise to establish same.

Schenectady, N. Y.—Secretary has been instructed to advertise for bids for water pipe fittings and thirty tons of lead for water bureau.

Raleigh, N. C.—Raleigh city commission sold to Security Trust Co. of Spartanburg, S. C., \$75,000 bonds for additional water plant extension, bid having been \$419 above par.

Coshocton, O.—Councilmen are said to favor plan of constructing new reservoir for city to have a 5,000,000-gal. capacity.

Dayton, O.—Bonds in sum of \$30,000 have been authorized by ordinance passed by City Commission for purpose of constructing water pipes across Miami River near Fifth St. bridge and Dayton View bridge.

Mansfield, O.—Extension of waterworks is under consideration.

Portland, Ore.—Commissioner Daly, of Dept. of Public Utilities, plans extensions of mains to cost \$125,000. City auditor will be asked to advertise for bids for cast iron pipe for two mains and a number of laterals.

Erie, Pa.—To prevent water in settling basin east of filter plant from washing away bank on north end, Water Commissioners have decided to build retaining wall of concrete. Cost has not been ascertained, but it will amount to several thousand dollars. Wall will be more than 100 feet long, 12 inches thick and about 5 feet high.

Pittsburgh, Pa.—Ordinance has been introduced authorizing issuance of \$300,000 of bonds for expansion and improvement of the city water service, the bonds having been authorized in 1912, and only \$1,200,000 of bonds having been issued.

Lemmon, S. D.—City of Lemmon is contemplating establishment of complete new water system with gravity pressure and mains to be laid throughout residence district.

Aberdeen, Wash.—Representatives of towns of Aberdeen, Hoquiam, Cosmopolis, Montesano, Elma and Satop have decided on water district to secure water from headwaters of Wynoochee River. District which has been agreed upon includes all district within incorporated portions of these cities and some extra territory at Cosmopolis, Aberdeen and Hoquiam. Assessed valuation on which levy may be made to build system is over \$14,000,000.

CONTRACTS AWARDED.

Waukegan, Ill.—By Board of Local Improvements for laying of water main in South Victory St. to H. C. Patterson, at \$387.29 and on Lewis Pl. at \$467.95.

Michigan City, Ind.—Bids were received by Krehbiel Engineering Co., Chicago, for construction of water system as follows: Section A, concrete work; section B, small pumps, etc.; section C, both A and B. M. W. Holben, Chicago, \$4,160; Section A. Reed Reed, Michigan City, section A, \$7,100; section B, \$13,950; section C, \$19,250. Rich & Johnson, Chicago, section A and B \$18,000. Brady & Co., Chicago, section A, \$8,851; section B, \$15,672; section C, \$24,523. M. H. Crane Estate, Chicago, section B, \$16,912.

Boston, Mass.—Contract awarded Aug. 7 by Metropolitan Water & Sewerage Board for steel tank or reservoir on Bellevue Hill to Walsh's Holyoke Steam Boiler Works, Holyoke, at \$19,397. Other bids: Chicago Bridge & Iron Works, New York, \$19,540; Petroleum Iron Works, Sharon, Pa., \$19,870; Pittsburgh-Des Moines Steel Co., New York, \$20,900; Ritter-Conley Mfg. Co., Pittsburgh, Pa., \$23,865.

Fergus Falls, Minn.—For constructing 600,000 gal. concrete reservoir at State Asylum to John Lauritzen, Fergus Falls, at \$7,029. D. Mullen is Secy. Bd. State Control, St. Paul.

Virginia, Minn.—There was wide variance in figures in bids opened by water and light board for erecting proposed 1,000,000-gallon water tank near site of present reservoir, lowest being about \$4,000 under highest. Risberg & Marwick of Virginia got contract for \$17,898. Other bidders were Ward & Wrightman, Sioux City, Ia.; Lawrence & McCann, Evelleth; Charles C. Butler, Virginia. Work is to be completed in three months.

Kansas City, Mo.—For furnishing and delivering gate valves to Columbian Iron Wks., Chattanooga, Tenn. Jas. S. Armstrong is Secretary Board Fire and Water Commissioners.

Henniker, N. H.—Town has purchased all of stock of Henniker Spring Water Co. in order to construct new town system. The contract for digging, laying and covering pipe for new system, which is to extend 32,000 ft., has been let to Susi & Williams, of Boston, for \$17,000, which includes work on reservoirs and all cement work, all to be completed by Nov. 15, 1914.

Schenectady, N. Y.—By Bd. Contract & Supply for furnishing material and constructing a 20,000,000-gal. reservoir

on Bevis Hill in Niskayuna, near easterly boundary of city, to Sutton & Carson Co., Ocean City, N. J., at \$22,878. Unofficial totals of four next lowest bids: State Highway Constr. Co., Beacon, \$240,304; John J. Hart, Peekskill, \$246,522; Barzaghi-Vought Co., New York, \$248,200; Brown & Lowe Co., Schenectady, \$248,319.

Cincinnati, O.—Contract awarded for furnishing c. i. pipe castings, etc., to U. S. Cast Iron Pipe & Fdry. Co., for Spring Grove Ave., Winton Rd. to Mill Creek, at \$29,599 and Eastern Ave. and Deerfield Rd., \$11,200.

Eugene, Ore.—Water Board after bids for construction of new reservoir on College Hill were opened and examined, decided to adopt deep type in preference to one of the shallow type. Capacity of the reservoir will be over 2,000,000 gallons. Board called for three bids each on the deep and shallow type, one bid to be for excavation, another to be for concrete work and third to be for reservoir complete. Barney & Johnson, of Portland, appear to have the lowest bid and will probably be given contract. Bids are as follows: Collier & Stevenson, Salem—Deep, complete, \$11,770; shallow, complete, \$10,690. Guy F. Pyle, Eugene—Deep, concrete, \$3,265; shallow, concrete, \$3,310. Barney & Johnson, Portland—Deep, complete, \$7,665; shallow, complete, \$7,054. Stein Bros., Eugene—Deep, concrete, \$3,175; shallow, concrete, \$3,175. A. C. Mathews, Eugene—Deep, excavation, \$8,150; shallow, excavation, \$9,250. Appling-Griggs Co., Tacoma—Deep, excavation, \$14,930; concrete, \$10,315; complete, \$24,945. Shallow, excavation, \$12,800; concrete, \$9,870; complete, \$22,375.

Portland, Ore.—Contract for 800 water meters for water bureau was distributed by Council on recommendation of Commissioner Daly to four firms. Colby Engineering Company was awarded contract for furnishing 350 five-eighths inch Worthington meters for \$5.80 each; the Hersey Meter Company was given order for similar number of Hersey meters of same size for \$5.92 each, and Badger Meter Company was awarded the contract for 50 Badger meters of the same size for \$5.69 each. To National Meter Company contract for furnishing 25 three-fourths inch meters at \$10 each and 25 one-inch meters at \$14 each was awarded.

Shippenburg, Pa.—Shippenburg's Council opened bids for water system improvements and awarded contract to W. G. Fritz Co. of Newark, N. J., at figure of \$23,900, using 10-in. cast iron pipe. Company's bids, using 10-in. wood stave pipe, was \$22,300; additional concrete per cu. yd., \$14; additional puddle, per cu. yd., \$1.50; rock excavation per cu. yd., \$3.50; credit for concrete not placed in foundations per cu. yd., \$12. Work is to be completed within 75 days. Other bids were submitted as follows: Charles Dugan, Williamsport, iron pipe, \$31,500; wood, \$24,000. J. I. Dick, Scottsdale (one of Carlisle's sewerage system contractors), iron pipe, \$32,875, and wood pipe \$29,100. W. H. Angle, Hagerstown (another contractor on Carlisle sewerage system job), iron pipe, \$29,338.70; wood pipe, 27,338.70. Whiting Turner bid only using iron pipe, \$32,700. Dugan wanted 90 days in which to do the work. Dick 125 days, Angle 125 days and Turner 90 days.

Willis Point, Tex.—By City Council for construction of dam for reservoir to supply city, to W. R. Palmer, Wichita Falls.

Seattle, Wash.—Itemized bid of Meacham & Babcock, Central Bldg., Seattle, successful bidders for constructing Lake Union Tunnel (upper level) at 7th Ave. Northeast Cedar River water supply is as follows: Fixed charges (lump sum), \$10,000; 139.5 lin. ft. sinking shafts, \$464.70; 558 cu. yds. concrete shaft lining, \$10; 897 lin. ft. driving tunnel, \$75.30; 2,923 cu. yds. concrete tunnel lining, \$10,600; 14,300 lbs. special castings, 6 cts.; 100 cu. yds. grout, \$36; 200 lin. ft. 2-in. galv. iron pipe, 60 cts.; total \$183,512; preliminary estimate, \$175,976. A. H. Dimock is City Engineer.

Seattle, Wash.—By Board of Public Works for supplying hydrants to H. G. Niblett at \$1,216.30.

Seattle, Wash.—The bid in detail of Meacham & Babcock, Central Bldg., Seattle, successful bidders for constructing Lake Union Tunnel (upper level) at 7th Ave. Northeast Cedar River water supply is as follows: Fixed charges (lump sum), \$10,000; 139.5 lin. ft. sinking shafts, \$464.70; 558 cu. yds. concrete shaft lining, \$10; 897 lin. ft. driving tunnel,

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LIGHTING AND POWER

Hemet, Calif.—Board of City Trustees is considering installation of municipal power plant to furnish electricity for light and power.

Sacramento, Cal.—Plans and specifications for erection of electroliers on Maple Ave. from J to M St. were presented to City Commission by City Electrician G. S. Pearce. Plans show that 13 electroliers will cost \$1,614 and 24 electroliers will cost \$2,438. Lighting for the 13 electroliers will cost \$175 per year, and for the 24 electroliers \$324.

Loveland, Colo.—Special taxpayers' election has voted in favor of establishment of proposed \$120,000 municipal lighting system for Loveland. City aldermen were authorized to proceed with completion of plans and submission of bond issue proposition to be voted on at general election in November.

Guantanamo, Cuba.—Bids opened at Bureau Yards and Docks, Navy Dept., Washington, D. C., for Spec. 2087, furnishing and installing four 200-hp. water tube boilers, with accessories in Central Power Plant, Naval Station, Guantanamo: Babcock & Wilcox Co., 1010 North American Bldg., Philadelphia, Pa. (2 bids), \$10,865 and \$21,459; Heine Safety Boiler Co., 1120 Pennsylvania Bldg., Philadelphia, Pa., \$9,610; E. Keeler Co., 228 West St., Williamsport, Pa. (2 bids), \$10,327 and \$21,181; Gas Engine & Power Co. & Chas. L. Seabury & Co., Consolidated Morris Heights, N. Y., \$23,270.

Wilmington, Del.—Councilman T. W. Wood will soon propose a municipal gas plant before Council.

Charter Oak, Ia.—The special election to decide whether or not bonds be issued for construction of new lighting plant for city gave a majority in favor of project.

Oskaloosa, Ia.—Solicitations for new "Great White Way" of Oskaloosa are going forward steadily from day to day with prospects bright for extensions on other thoroughfares. It is understood that cost of equipment and installation along first two blocks of First Ave. west is practically assured by property owners, etc.

Duluth, Minn.—Lighting of Superior St. is being discussed.

North Bend, Neb.—North Bend will expand \$21,000 for new lighting system; \$37,000 bond issue for lights and sewerage was carried at election.

Bordentown, N. J.—City Commission is considering the installation of municipal electric lighting plant, estimated to cost about \$40,000.

Camden, N. J.—Ordinance has been passed authorizing making and entering into of contract between city of Camden and Public Service Electric Co. for construction of conduits, and an underground electrical distribution system. W. D. Brown is City Clerk.

Newark, N. J.—The Roseland Borough Council has instructed Chairman George A. Flammer of lighting committee to request Public Service Electric Co. to extend its lines down Eagle Rock Ave. and over Passaic Ave. Street lights cannot be placed there this year, it was stated, as appropriation is exhausted.

Seaside Heights, N. J.—It is reported that a municipal lighting plant is being planned for Seaside Heights and \$10,000 bonds will be issued.

Beacon, N. Y.—A municipal lighting plant is proposition under consideration of light investigation committee in Beacon and will, if investigation of expense proves it adaptable to local curriculum, be embodied in suggestion to public of report of investigation committee.

Niagara Falls, N. Y.—Board of Public Works will shortly advertise for bids for extension of decorative lighting system in Third and Main Sts., for which \$10,000 is provided in budget. Money will be available this fall, and work will be completed before winter. Same system as now installed will be followed out.

Concord, N. C.—Water and Light Board has decided to establish a white way and equipment was ordered purchased by Supt. Fisher.

Greensboro, S. C.—City Commissioners favor the installation of a white way.

Mangum, Okla.—Citizens have voted to issue bonds for constructing municipal electric light plant.

Cottage Grove, Ore.—As result of action taken by City Council, city will have

second electric lighting company providing franchise is voted at special election called for August 20.

Gettysburg, Penn.—Town Council has adopted resolution providing for establishment of municipal electric light plant.

Lewistown, Pa.—Experts declared that cost of municipal lighting plant would be \$70,000. Council will act on proposition later.

Lewistown, Pa.—Council has adopted ordinance putting proposition of \$75,000 loan for building of municipal light plant up to voters.

New Castle, Pa.—Council has ordered additional arc lights in various parts of city.

Williamsport, Pa.—C. L. Kinsloe, of State College, has been employed by city to prepare specifications for contract for lighting the city.

Winnsboro, S. C.—Citizens have voted to issue \$100,000 bonds, to be used for extensions to electric light system; also for water works and sewerage system. J. B. McCrary Co., Atlanta, Ga., are Engrs.

San Antonio, Tex.—Council has accepted offer of San Antonio Rotary Club to illuminate river with 1,400 colored electric lights, the city to pay yearly maintenance.

Chehalis, Wash.—Chehalis City Commission is figuring on purchase of electric lighting system from the Washington-Oregon corporation if matters so shape themselves that satisfactory deal might be worked out.

Bolton, Ont.—Citizens voted Aug. 3 to issue bonds for constructing hydro power plant. The Hydro Electric Commission, Toronto, will have charge of the work.

CONTRACTS AWARDED.

Manilla, Iowa.—City Council has awarded contracts for municipal electric light plant to Midwest Electric Co., Omaha, Neb., at \$12,175 for the equipment of the building, to include a 120-hp. Diesel oil engine and a 75-kw. dynamo. Contract for overhead equipment was awarded to the Standard Electric Co., Waterloo, Iowa, at \$4830.

Buhl, Minn.—Contract for about \$50,000 for improvements on water and light system reported awarded by Village Council to R. B. Whitaker & Co., St. Paul.

Biwabik, Minn.—Village Council has contracted with Great Northern Power Co. to furnish light and power for this village. Biwabik will get rate of 2.75 cts. per kilowatt hour under contract, when use of day current becomes general.

Burrillville, R. I.—Lighting Committee of Harrisville Fire District has accepted and signed contract with Pascoag Fire District for lighting of streets of Harrisville with electric lights. Contract is for term of three years, and begins Nov. 1 next. Sixty 60-candlepower lights are to be installed and midnight, moonlight service is to be used.

Longview, Tex.—Contract awarded to Roach-Manigan Paving Co., Ft. Worth, for construction of power and generator house, including all machinery; also construction of water tower.

FIRE EQUIPMENT

Auburn, Cal.—Movement has been started to purchase auto fire truck.

Hayward, Cal.—See Miscellaneous.

New Haven, Conn.—Appropriation will be considered for purchase of two motor pumping engines.

Washington, D. C.—Congress has allowed for funds for new engine house and equipment and for auto pumping engine for No. 20 engine company.

Chicago Heights, Ill.—Purchase of auto combination chemical and hose car is being considered.

Fort Dodge, Ia.—Chief F. B. Trustry says that the city expects to purchase a motor aerial truck next year.

Cambridge, Mass.—Appropriation of \$17,000 is being urged for purchase of motorized steamer, combination chemical, hose car and tractor.

Greenfield, Mass.—According to Chief Philip Partenheimer, city will purchase motor combination chemical and hose wagon next May.

Waltham, Mass.—Use of automobile tractors in Fire Department is being looked into by Chief George L. Johnson, and it is possible that Chief may send request to Board of Aldermen in fall for appropriation for purchase of one or more machines.

Hamtramck, Mich.—Appropriation has been allowed for erection of fire station and purchase of apparatus.

Hibbing, Minn.—Purchase of new automobile truck for Station No. 1 is recommended by Fire Chief McIlhargey.

Concord, N. H.—Board of Aldermen authorized purchase of motor fire apparatus for West Concord, at cost not to exceed \$2,500.

New Brunswick, N. J.—Chief Earle, of the Highland Fire Department recommended that Borough Council purchase a triple combination auto fire engine.

Perth Amboy, N. J.—Bids for motor fire apparatus were received and opened as follows: Ingle-Hunt Motors Co., Newark, Stewart Chassis with specified equipment, \$2,635; Perth Amboy Garage Co., White Motor Truck, \$5,650; Hoagland-Thayer Inc., Newark, Adams Motor Truck, \$3,800; Nott Fire Engine Co., Nott Motor Truck, \$7,000; Frank Van Syckle Garage Co., Seagrave Truck, 4 cylinder, \$5,900; Seagrave Truck, 6 cylinder, \$6,200; Boyd 6 cylinder motor truck, \$6,500; Boyd 4 cylinder motor truck, \$5,850; Knox 6 cylinder motor truck, \$7,500. On motion bids were referred to the committee on fire for consideration.

Perth Amboy, N. J.—Members of Board of Aldermen, who are considering bids for motor-drawn hose apparatus for installation in city, were given private demonstration of American-La France fire engine in South Amboy.

Amityville, N. Y.—Reported that Village Trustees have appropriated \$750 for new hose and have appointed committee to make purchase.

Middletown, O.—City Clerk John Kunz reports the following bids received Aug. 6 for furnishing two motor combination chemical and hose wagons: Ahrens-Fox Fire Engine Co., Cincinnati, O., \$6,000 each; American-La France Fire Engine Co., Elmira, N. Y., \$4,500, \$5,250 and \$5,750; Brockway Motor Truck Co., Cortland, N. Y., \$2,750 and \$3,500; Peerless Motor Co., Cleveland, O., \$5,300 and \$5,400; George C. Hale, Kansas City, Mo., \$4,000 and \$5,000; Seagrave Co., Columbus, O., \$5,100 and \$5,200; Harwood-Barley Mfg. Co., Marion, Ind., \$4,000; Martin Carriage Works, York, Pa., \$4,500 and \$5,500; Robinson Fire Apparatus Mfg. Co., St. Louis, Mo., \$5,500; James Boyd & Bro., Philadelphia, Pa., \$5,500.

Sandusky, Ohio.—Bids have been opened and will be considered by the Board of Control for three plans of constructing fire station. Plan No. 1 calls for concrete construction of all floors and beams, with tile partitions; Plan No. 2 calls for concrete on first floor and steel and wooden joists for second and third floors; plan No. 3 consists of same construction as No. 1 except partitions would be of frame studding and the plaster of apparatus and lounging rooms would be of sand finish instead of caen stone finish. Bids were as follows: G. W. Dorezbach & Bro., \$27,342.80, \$26,883.36 and \$26,324.32; George Feick & Co., \$29,440, \$27,540 and \$28,785; Schnurr & Walsh Bros., \$24,485, \$24,075 and \$24,010; L. Zorback, \$25,200, \$25,200 and \$24,999.

Corvallis, Ore.—City plans purchase of motor pumping engine, according to F. R. Graham, Chief.

Eugene, Ore.—Chief H. D. Briggs states that city will purchase motor combination chemical and hose wagon at early date.

Lebanon, Pa.—Means are being considered of buying motor apparatus for Reserve Fire Co.

Pittsburgh, Pa.—Ordinances have been introduced providing for contract for fire apparatus to not exceed in cost \$120,000 for six second-size fire engines, with gasoline motor propelled tractors, two first size engines with gasoline motor propelled tractors; 10 gasoline roadsters; five separate tractors for fire engines, and two separate tractors for trucks. Bureau of Fire estimates cost of this equipment at \$117,000. Ordinance was referred to the Finance Committee.

West Hazleton, Pa.—Purchase of triple auto fire engine is being considered.

Williamsport, Pa.—Following bids were received recently for furnishing 1,500 ft. of hose: Empire Rubber & Tire Co., Trenton, N. J., 88 cts.; Bork Bros. & Co., Williamsport, 50 cts., 60 cts. and 70 cts.; Villinge Plumbing & Heating Co., Williamsport, 77 cts. and 83 cts.; Kline & Co., Williamsport, 70 cts., 80 cts. and 90 cts.; Rothfus-Howard Rubber Co., Williamsport, 90 cts., \$1 and \$1.10; Manhattan Rubber Co., Passaic, N. J., 54 cts. and 74 cts.; United & Globe Rubber Co., 90 cts., \$1 and \$1.10; Iroquois Rubber Co., Cleveland, O., 70 cts., 75 cts. and 85 cts.;

Goodyear Tire & Rubber Co., Akron, O., 70 cts., 80 cts. and 90 cts.; Eureka Fire Hose Co., New York City, 90 cts., \$1 and \$1.10; Bi-Lateral Fire Hose Co., Chicago, Ill., 95 cts., \$1 and \$1.10; Fabric Fire Hose Co., New York City, \$1, \$1.05 and \$1.10; Gutta Percha & Rubber Mfg. Co., New York City, 85 cts., \$1.05 and \$1.15; John S. Latta & Co., Philadelphia, Pa., 50 cts.

Hampton, Va.—Council has decided to purchase a complete combination hose wagon, chemical apparatus, hook and ladder and tractor.

Hampton, Va.—Council is being urged to purchase tractor for fire department.

Milwaukee, Wis.—Plans are being prepared for a fire station and a fireboat station for the city. J. A. Mesiroff is City Engineer.

CONTRACTS AWARDED.

Santa Ana, Cal.—Bid of Boston Rubber Co. to furnish city with 500 ft. of 2½-in. fire hose at 80 cts. per ft. was accepted.

Joplin, Mo.—Purchase of two turret nozzles for fire autos has been ordered. The equipment will be bought from American-La France Co., through Sardius Smith, Jr., Joplin, agent for the firm.

Joplin, Mo.—It has been decided to purchase 2,000 ft. of hose for fire department from the H. W. Johns-Manville Co. of New York and Milwaukee at 85 cts. a foot. Hose will be delivered within about sixty days.

Elizabeth, N. J.—City has awarded contracts as follows for constructing fire station No. 5: brick masonry, to L. Bellucio & Bro., Elizabeth; carpentry, to C. A. Craig, Elizabeth; plumbing, to Hoffman & Wachter, Elizabeth; and electrical work, to E. F. Guine, Elizabeth. Estimated total cost, \$20,000.

Jersey City, N. J.—To Eureka Fire Hose Co., of New York City, and Gutta Percha & Rubber Mfg. Co., contract for 6,000 ft. of hose each, at their prices of \$1.09 and \$1.15 respectively.

Red Bank, N. J.—For furnishing 2,000 ft. of hose as follows: Fabric Fire Hose Co., New York City, at \$1.05 per foot; Empire Rubber & Tire Co., Trenton, N. J., 88 cts.; United & Globe Rubber Co., Trenton, N. J., 94 cts., and Diamond Rubber Co., Akron, O., at 88c.

Schenectady, N. Y.—Contract for construction of new engine house for Hose Company No. 3, in Jay St., has been awarded to John L. Nolan at \$8,700 by Board of Contract and Supply.

BRIDGES

Camden, Ark.—Ouachita County will shortly erect two 60 ft. bridges across Two Bayou and Smackover Creek, also 40 ft. bridge across Bush Creek and two 34 ft. spans across Freeo Creek. E. B. McCall is County Judge.

Texarkana, Ark.—Authorization has come from Washington, D. C., to build bridge over Sulphur River.

Phoenix, Ariz.—State Board of Control has approved plans for Canon Diablo Bridge, Coconino County, to cost about \$11,000, and for bridges across Milky and Weaver dam washes, Apache County, costing about \$14,000 for two. Lamar Cobb is State Engineer.

Santa Ana, Cal.—City Clerk has been instructed to advertise for bids for plans and specifications for concrete bridge across the Santa Ana River.

Santa Cruz, Cal.—Citizens are urging council to build a concrete bridge over the San Lorenzo River to cost between \$30,000 and \$40,000.

Orange, Cal.—East Chapman St. bridge is to be replaced with concrete bridge. It has been decided to make bridge three span. It will be 165 feet long. It is to be built jointly by city of Orange and county which will pay one-third of cost.

Jacksonville, Fla.—Engineers will shortly be employed by Duval County Commissioners to prepare plans for bascule type of bridge across St. Johns River.

Tampa, Fla.—Bids will soon be advertised for construction of 24 bridges. Work on these bridges has been relinquished by previous contractor.

Macon, Ga.—Bibb County will vote Oct. 7 on \$1,000,000 bonds for bridges, etc.

Clinton, Ia.—A number of reinforced concrete bridges and culverts and concrete roads are soon to be constructed by city.

Bismarck, N. D.—State Engineer Bliss has recently furnished Mercer County with standard bridge specifications. County expects to build from 20 to 25 bridges this season and state engineer has been requested to furnish inspection during their construction.